Corrective Measures Work Plan

SWMU 25 – FORMER BATTERY SHOP

TOOELE ARMY DEPOT
TOOELE, UTAH

Final

Prepared for:

Tooele Army Depot
Tooele, Utah

Prepared by:

U.S. Army Corps
of Engineers
Sacramento District

July 2003

EXECUTIVE SUMMARY

This Corrective Measures Work Plan (CMWP) describes the activities required to remediate Solid Waste Management Unit (SWMU) 25, known as the former Battery Shop, at Tooele Army Depot (TEAD), Tooele, Utah. This CMWP describes the work process involved in mitigating the potential threat to public health and the environment by excavation and disposal of soil contaminated with metals associated with batteries. The Battery Shop was used for the maintenance and repair of vehicle and forklift batteries from 1980 to 1993. SWMU 25 includes the former Battery Shop (Building 1252), two washdown pads and a drainage ditch that previously received washdown runoff from the Shop between 1980 and 1993. The Resource Conservation and Recovery Act (RCRA) Facilities Investigation (RFI) of SWMU 25 determined that surface soil at the site contains elevated levels of lead, arsenic and thallium above the Corrective Action Objectives (CAOs). A Corrective Measures Study (CMS) Report (Dames & Moore, 2001) determined that excavation and off-post treatment/disposal with land use restrictions was the most appropriate remediation alternative for SWMU 25. Land use restrictions will be incorporated into the Tooele Army Depot Master Plan, which will be discussed in the Site Management Plan to be prepared after the completion of the corrective measures.

SWMU 25 is being managed under a RCRA Corrective Action Permit (CAP). The Permit was issued to Tooele Army Depot by the State of Utah Department of Environmental Quality (UDEQ), Division of Solid and Hazardous Waste.

The purpose of this CMWP is to implement the recommended corrective measures alternative for SWMU 25. This CMWP is comprised of a Remedial Action Plan (RAP), a Health and Safety Design Analysis (HSDA), and a Sampling and Analysis Plan (SAP). The RAP describes the remediation procedures to be performed at the site; the HSDA describes health and safety requirements for protection of both the workers on the site and the surrounding community during the site work at SWMU 25; and the SAP describes the confirmation sampling, waste profile characterization sampling, and laboratory analytical procedures. This CMWP has been prepared by the U.S. Army Corps of Engineers (USACE) on behalf of TEAD, and shall be used to obtain regulatory concurrence with the plan prior to execution.

REMEDIAL ACTION PLAN
SWMU 25 - CHARCOAL MATERIAL AREA
TOOELE ARMY DEPOT
TOOELE, UTAH

Final

Prepared for:

Tooele Army Depot
Environmental Office

Prepared by:

U.S. Army Corps of Engineers
Sacramento District

July 2003

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ACRONYMS AND ABBREVIATIONS

bgs	below ground surface
BRAC	Base Realignment and Closure
CAO	Corrective Action Objective
CAP	Corrective Action Plan
CDQMP	Chemical Data Quality Management Plan
CFR	Code of Federal Regulations
CMCR	Corrective Measures Completion Report
CMS	Corrective Measures Study
COC	Contaminant of Concern
COPC	Contaminant of Potential Concern
COR	Contracting Officer's Representative
CQCP	Contractor’s Quality Control Plan
DOT	U.S. Department of Transportation
EO	Environmental Office
EPA	Environmental Protection Agency
FFA	Federal Facilities Agreement
HDPE	High Density Poleytheylene
HSDA	Health and Safety Design Analysis
IRP	Installation Restoration Program
LDR	Land Disposal Restrictions
mg/L	milligram per liter
NPL	National Priorities List
POC	Point of Contact
QA/QC	Quality Assurance
QCSR	Quality Control Summary Report
RAP	Remedial Action Plan
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SAP	Sampling and Analysis Plan
SOP	Standard Operating Procedure
SSHP	Site Safety and Health Plan
SWERA	Site-Wide Ecological Risk Assessment
SWMU	Solid Waste Management Unit
TCLP	Toxicity Characteristic Leaching Procedure
TEAD	Tooele Army Depot
TEAD-N	Tooele Army Depot - North
UAC	Utah Administrative Code
USACE	United States Army Corps of Engineers
UDEQ	Utah Department of Environmental Quality
VOC	Volatile Organic Compound

REMEDIAL ACTION PLAN
SWMU 25 – FORMER BATTERY SHOP
TOOELE ARMY DEPOT, TOOELE, UTAH

1.0 INTRODUCTION

1.1 Scope of Remedial Action Plan

This Remedial Action Plan (RAP) describes the activities required to remediate Solid Waste Management Unit 25 (SWMU 25), known as the former Battery Shop, at Tooele Army Depot (TEAD), in Tooele, Utah. The former Battery Shop (Building 1252) was used for maintenance and repair of vehicle and forklift batteries from 1980 to 1993.

The Phase II Resource Conservation and Recover Act (RCRA) Facility Investigation (RFI) Report (Rust E&I, 1995) identified unacceptable cancer risks for hypothetical future adult and child residents at SWMU 25. Therefore, SWMU 25 was included in the Corrective Measure Study (CMS) process according to Environmental Protection Agency (EPA) guidance and Utah Administrative Code (UAC) R315-101-6 (c)(3). The CMS Work Plan (Dames & Moore, 2000) identified contaminants of concern (COCs) by comparing the maximum concentration of each contaminant of potential concern (COPC) identified in the Phase II RFI Report to its respective quantitative Corrective Action Objective (CAO). Based on this evaluation, arsenic, lead and thallium were identified as COCs in surface soil; arsenic was the only COC identified for subsurface soil. The CMS Report (Dames & Moore, 2001) concluded that the concentrations of arsenic in surface and subsurface soil are likely due to background soil variation, not to site-related contamination; therefore, arsenic was not considered further for corrective measures. The CMS Report determined that excavation, off-post treatment/disposal and land use restrictions is the most appropriate remediation alternative. Land use restrictions will be incorporated into the Tooele Army Depot Master Plan, which will be discussed in the Site Management Plan to be prepared after the completion of the corrective measures.

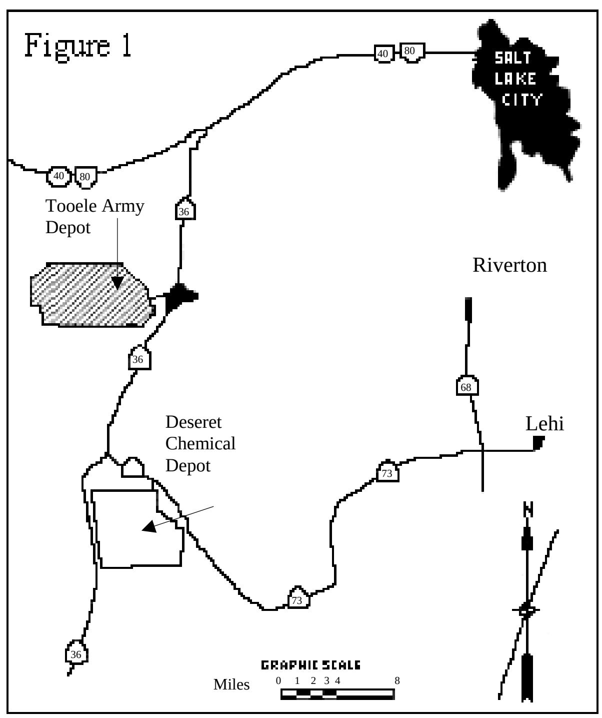
The purpose of this RAP is to describe the steps required to implement the recommended alternative as described in the CMS Report. The CMWP is comprised of this Remedial Action Plan (RAP), a Health and Safety Design Analysis (HSDA), and a Sampling and Analysis Plan (SAP). The RAP describes the remediation procedures to be performed at the site; the HSDA describes health and safety requirements for protection of both the workers on the site and the surrounding community during the site work at SWMU 25; and the SAP describes the confirmation sampling, waste profile characterization sampling and laboratory analytical procedures. All activities within the CMWP shall be executed by the Remedial Action Contractor.

SWMU 25 is being managed under a RCRA Post Closure Permit administered by the State of Utah, Department of Environmental Quality, Division of Solid and Hazardous Waste (UDEQ). This RAP is being written for execution by a remedial Contractor. This CMWP has been prepared by the U.S. Army Corps of Engineers (USACE) on behalf of TEAD, and shall be used to obtain regulatory concurrence with the plan prior to execution.

1.2 Site Description and History

1.2.1 Installation Location and History

TEAD is located 7 miles south of the Great Salt Lake, approximately 35 miles southwest of Salt Lake City, Utah, and immediately west of the city of Tooele (Figure 1). The Tooele Ordnance Depot was established by the U.S. Army Ordnance Department in April 1942. In 1949, Tooele Ordnance Depot assumed command of Deseret Chemical Depot, located 17 miles south of Tooele. The installation was re-designated as Tooele Army Depot – North in August 1962.

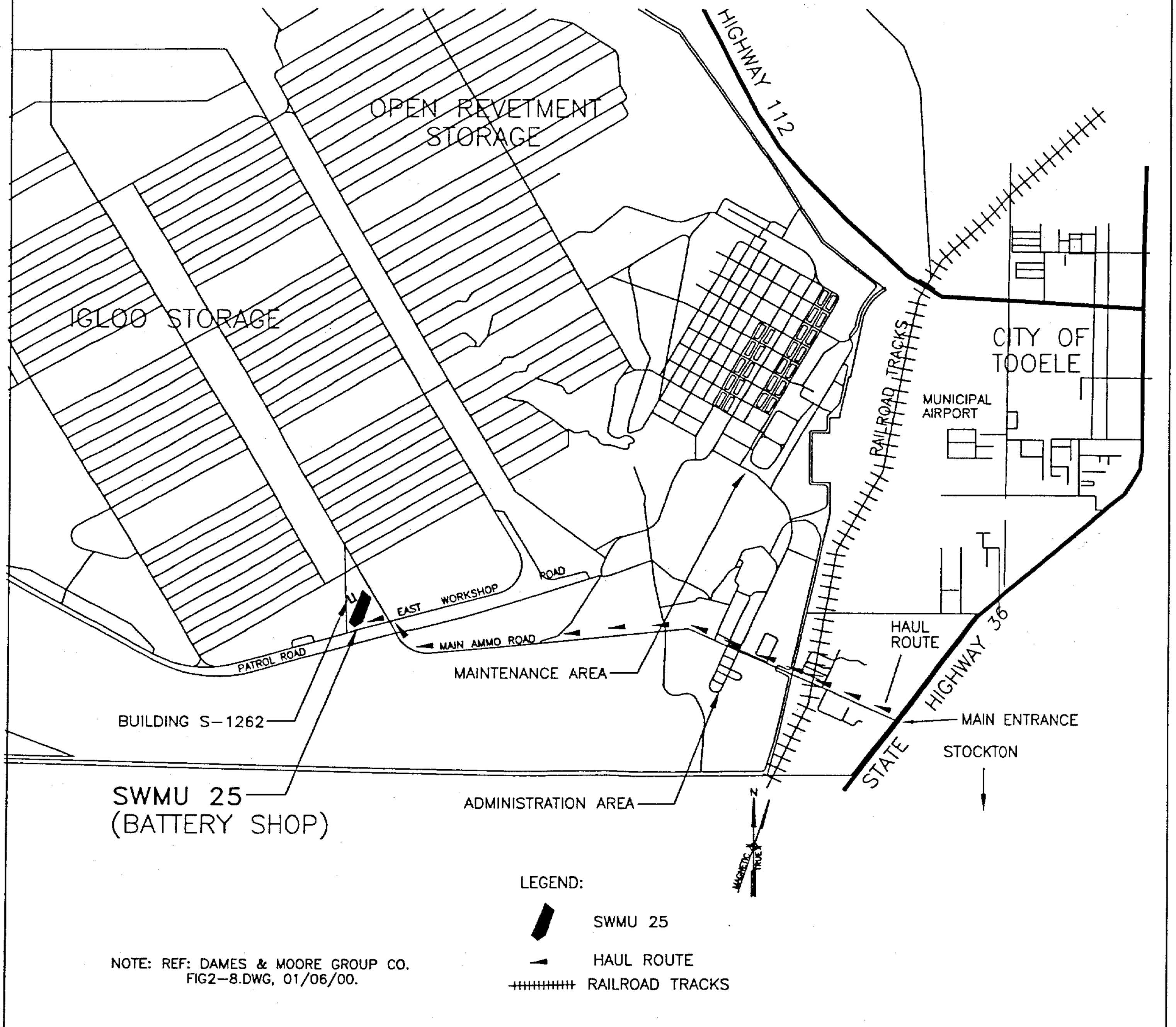


Deseret Chemical Depot was realigned in 1996 and the designation of North was removed from TEAD's name. A portion of TEAD was placed on the Base Realignment and Closure (BRAC) list in 1993. Prior to inclusion on the BRAC list, TEAD's primary mission was the storage, maintenance, and demilitarization of military vehicles, topographic equipment, troop support items, power generators, and conventional munitions. The realignment transferred all vehicle and equipment duties to Red River Army Depot, Texas. TEAD's current mission is the storage, maintenance, and demilitarization of conventional munitions. SWMU 25 is on the active (non-BRAC) portion of the base.

As a result of past activities at the installation, TEAD was included in the U.S. Army's Installation Restoration Program (IRP) in 1978. TEAD was placed on the National Priorities List (NPL) in 1990. A Federal Facility Agreement (FFA) was entered into between the U.S. Army, U.S. Environmental Protection Agency (EPA) Region VIII, and the State of Utah in 1991. As a result of past operations and environmental investigations, a number of sites on the installation have been identified and designated as SWMUs and a RCRA Post-Closure Permit was issued by the State of Utah in 1991. The permit expired in January 2001. A new RCRA Post-Closure and corrective action permit (CAP) was issued to TEAD in February 2001. This CAP requires actions at 42 SWMUs. SWMU 25 is one of the 42 SWMUs identified in the CAP and has been incorporated into the Known Releases SWMUs.

1.2.2 Site Description

SWMU 25 is located north of East Workshop Road in the south central portion of TEAD (Figures 2 & 3). SWMU 25 is grassy and relatively flat. SWMU 25 includes the former Battery Shop, two washdown pads, a drainpipe and a 350-foot long drainage ditch extending northeast of the Battery Shop. The Battery Shop was used for the maintenance and repair of vehicle and forklift batteries from 1980 to 1993. From 1980 to 1982, spent battery acid and washdown water were discharged directly into the ditch. Beginning in 1982, these liquids were neutralized with sodium bicarbonate or sodium hydroxide before being discharged into the ditch. Acid began being barreled for disposal in 1986. The shop floor was still washed down daily with sodium bicarbonate, which was discharged into the ditch. In 1990, the drain was sealed, and the sump



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JULY 2003

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SWMU 25 REMEDIAL ACTION PLAN

SITE LOCATION MAP AND HAUL ROUTE

SCALE: NOT TO SCALE

FIGURE: 2

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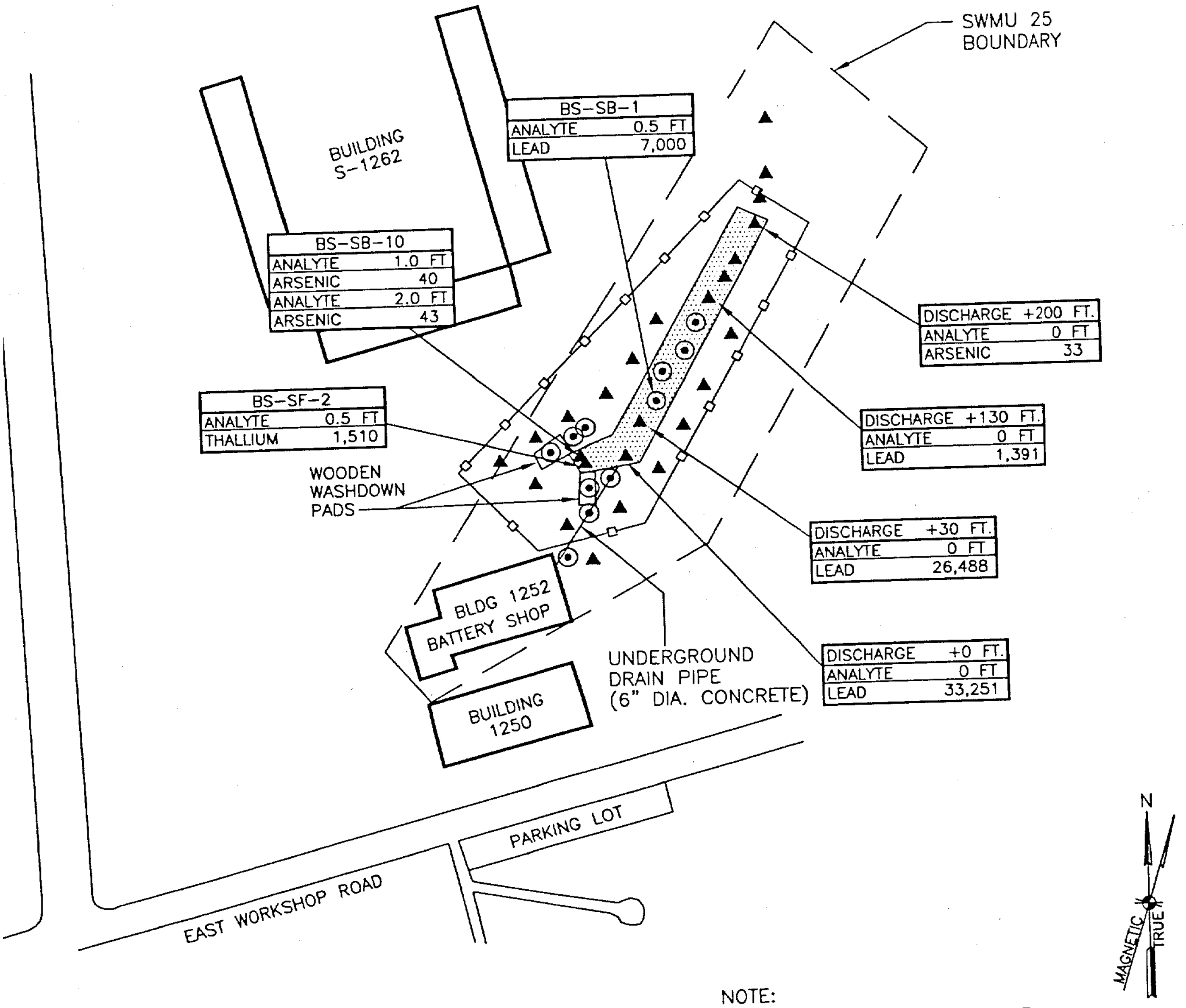

NOTE:

1. REF: RUST E & I, 1995
2. DAMES & MOORE, FIG7-2.DWG, FEB. 2000

LEGEND:

- SURFACE SOIL SAMPLE
- SOIL BORING
- ESTIMATED EXTENT OF CONTAMINATION
- FENCE INSTALLED IN 1995
- UNDERGROUND PIPING
- AREA OF INITIAL EXCAVATION
- BUILDING 1250 — BUILDING
- SWMU BOUNDARY (APPROX)

ALL CONCENTRATIONS ARE IN MG/KG

GRAPHIC SCALE
0' 75' 150' 225'

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SWMU 25 REMEDIAL ACTION PLAN

SWMU BOUNDARY AND EXTENT OF CONTAMINATION

SCALE: NOTED

FIGURE: 3

leading to the drainpipe was used to collect washdown wastes. In 1995, TEAD fenced the contaminated portion of the drainage area to prevent exposure to on-post workers and grazing cattle. TEAD also instituted an inspection program for the fence, as required by the State of Utah.

1.3 Hydrogeologic Setting

TEAD is located in the Tooele Valley. Groundwater conditions vary greatly across the Valley with both unconfined and confined aquifers present. The depth to groundwater varies from less than 10 feet below the ground surface (bgs) near the Great Salt Lake to more than 1,500 feet bgs in the southwestern portion of Tooele Valley.

The general groundwater flow direction at TEAD is from the southeast to the northwest. Groundwater gradients at TEAD are relatively flat except in the northeastern area near the bedrock outcrops where gradients steepen considerably. Groundwater depths range from greater than 1,500 feet bgs in the southwestern area to approximately 150 feet bgs in the northern portion of TEAD. Depth to the groundwater at SWMU 25 is estimated to be approximately 250 feet bgs, based on depth to groundwater at the adjacent SWMUs 10/11, approximately 1,000 feet to the west.

1.4 Prior Investigations

After the Battery Shop was identified as SWMU 25, the first sampling was conducted in 1990 by TEAD personnel. Surface soil samples were collected at five locations: directly beneath the building discharge pipe, at 30, 130, and 200 feet down slope (northeast) of the discharge pipe, as well as at an unspecified background location. In addition to surface soil, samples were collected from 2 feet below ground surface (bgs) at two locations: directly beneath the building discharge pipe and 30 feet northeast of the discharge pipe.

All samples were analyzed for total metals, leachable metals (TCLP) and Volatile Organic Compounds (VOCs). VOCs were not detected in any samples. The highest total arsenic concentration (32.75 mg/kg) was found in the surface sample collected at 200 feet from the discharge pipe. The highest total lead concentration (33,251 mg/kg) was found in the surface sample collected near the mouth of the discharge pipe. The highest concentration of leachable lead was 121 mg/L and was detected in a surface sample. Concentrations of all other leachable metals were similar to those concentrations found in the background soil sample.

In 1994, Phase II sampling was conducted to confirm the previous investigation results and delineate the horizontal and vertical extent of metals contamination. Phase I and II surface and core-boring sampling locations are shown in Figure 2. Elevated concentrations of metals were detected near the discharge point from the Battery Shop, in the immediate vicinity of the washdown pads and in the narrow drainage area. The highest thallium concentration (1,510 ppm) was detected in a surface sample collected between the washdown pads and the drainpipe. This was the only sample that contained thallium in excess of the background concentration.

The results of the Phase I and II sampling show that the narrow drainage area downstream from the discharge pipe of the Battery Shop is contaminated with elevated concentrations of metals at the surface. The concentrations are highest at the point of discharge and rapidly decrease with distance down the drainage. Soil samples from soil borings drilled near the drainage indicate that contamination has not migrated vertically more than 5 to 9 feet below the surface. The contamination is restricted to the surface and near-surface soils/sediments in the narrow drainage area.

Results of the human health risk assessment (Rust E&I, 1995) indicate that SWMU 25, due to the presence of heavy metals, may pose carcinogenic and non-carcinogenic risks to hypothetical future on-site residents. The site-wide ecological risk assessment (SWERA) (Rust E&I, 1997) concluded that the Battery Shop poses a low ecological risk.

The CMS Work Plan (Dames & Moore, 2000) identified COCs by comparing the maximum concentration of each COPC identified in the Phase II RFI Report to its respective quantitative CAO. Based on this evaluation provided in Table 1.1, arsenic, lead, and thallium were determined to be COCs for surface soil. No COCs were identified for subsurface soil. Soil sample locations containing COC concentrations are provided on Figure 3.

Table 1.1: COPC Site Data

Chemical of Potential Concern (COPC) Surface Soil	Maximum Concentration, mg/kg	Corrective Action Objective (CAO), mg/kg	Surface Soil COC?
Antimony	94	160	No
Arsenic	43	32	Yes
Cadmium	13.6	220	No
Chromium (VI)	112	2,000	No
Cobalt	36	130,000	No
Copper	430	68,000	No
Lead	33,251	1,800	Yes
Mercury	6.1	440	No
Nickel	22.6	36,000	No
Thallium	1,510	120	Yes
Vanadium	109	1,600	No
Zinc	949	490,000	No
Chemical of Potential Concern (COPC) Subsurface Soil	Maximum Concentration, mg/kg	Corrective Action Objective (CAO), mg/kg	Subsurface Soil COC?
Cadmium	1.48	870	No
Chromium	45.9	23,000	No
Copper	137	64,000	No
Lead	520	1,800	No
Mercury	2.3	500	No
Silver	1.02	8,400	No
Zinc	121	510,000	No

After establishing COCs for the site, they were evaluated in conjunction with the results of the human health risk assessment to determine whether active corrective measures need to be evaluated. As stated in the Phase II RFI (Rust E & I, 1995), the human health risk assessment used the Exposure Point Concentration (EPC), a concentration that represents the likely concentration that an individual would likely be exposed to by working in the area of the SWMU, to calculate human health risks. The EPC for each COC was compared to its respective CAO, as shown in Table 1.2.

Table 1.2: COC Site Data

Chemical of Concern (COC)	Maximum Concentration, mg/kg	Exposure Point Concentration (EPC), mg/kg	Corrective Action Objective (CAO), mg/kg
Arsenic	43	23.3	32
Lead	33,251	2,350	1,800
Thallium	1,510	274	120

Since the EPC for arsenic is less than the CAO for arsenic, corrective measures are not required for arsenic at SWMU 25. However, the EPC for lead and thallium are higher than their corresponding CAOs, and thus corrective measures are required for lead and thallium at SWMU 25.

1.5 Extent of Contamination

The extent of contamination at SWMU 25 is shown on Figure 3 as the diagonal striped area. The total area and volume of contaminated soil are estimated at 8,100 square feet and 300 cubic yards, respectively. The depth of contamination is approximately one-foot bgs. There are no COCs in subsurface soil below one-foot bgs (Dames & Moore, 2001).

No groundwater monitoring was conducted at SWMU 25. The metals present in the soil are resistant to leaching due to low solubility and strong soil adsorption (Rust E&I, 1995). Therefore, based on the depth to groundwater (approximately 250 feet below ground surface [bgs]), the RFI concluded that the contaminants present at SWMU 25 are not expected to affect groundwater.

1.6 Selected Remedy

The CMS Report (Dames and Moore, 2001) concluded that excavation and off-post disposal and implementation of land use restrictions is the most appropriate alternative for SWMU 25. This alternative has the following components:

1. Excavate 300 yd^3 of contaminated soil to a depth of one-foot bgs;

2. Collect confirmation soil samples to ensure that concentrations of lead and thallium are below their respective CAOs. Soil sampling details are provided in Section 3.7 of this RAP and in the SAP;
3. Over-excavate, if confirmation soil samples indicate that remaining concentrations of lead and thallium remain in excess of the CAOs. Over-excavation will continue until remaining concentrations of lead and thallium are below their respective CAOs;
4. Collect characterization samples from the excavated soil for leachable metals analysis. Based on the results of the analysis, excavated soil will be transported off-post and treated/disposed immediately following excavation in accordance with U.S. Army protocol and Federal and State regulations; and
5. Regrading the excavated areas to maintain grade and flow lines.

1.7 Project Points of Contact (POC) and Staffing

1.7.1 USACE Project Staff

This RAP has been prepared by USACE, Sacramento District, under the general supervision of Roger Henderson, P.E. [(916) 557-5378]. The Project Manager for this project is Phred Strickland [(916) 557-7789]. The Technical Team Leader for the project is April Fontaine [(916) 557-7699].

1.7.2 TEAD Project Point of Contacts (POCs)

The personnel representing TEAD are:

Mr. Larry McFarland
Commander
Tooele Army Depot-Environmental Office
Attn: SMATE-CS-EO, Bldg. 8 (Larry McFarland)
Tooele Army Depot,
Tooele, Utah 84074-5033
Ph. 435-833-3235
Fax: 435-833-2839
e-mail: mcfarlal@emh2.tooele.army.mil

Mr. Dean Reynolds
Commander
Tooele Army Depot-Environmental Office
Attn: SMATE-CS-EO, Bldg. 8 (Dean Reynolds)
Tooele Army Depot,
Tooele, Utah 84074-5033
Ph. 435-833-3248
Fax: 435-833-2839
e-mail: reynoldd@emh2.tooele.army.mil

1.7.3 Regulatory POCs

The regulatory agencies for this project are: U.S. Environmental Protection Agency (EPA), Region 8, and UDEQ, Division of Solid and Hazardous Waste. The names and addresses for these points of contact are:

Mr. Jim Keifer
Remedial Program Manager
U.S. EPA, Region 8 8HWM-FF
999 18th Street, Suite 300
Denver, CO 80202-2466
Ph. 303-312-6907

Mr. Helge Gabert
State of Utah, Department of Environmental Quality
Div. of Solid and Hazardous Waste
P.O. Box 144880
Salt Lake City, UT 84114-4880
Ph. 801-538-6001

2.0 ADMINISTRATIVE REQUIREMENTS

2.1 Contractor Prepared Pre-Construction Plans

2.1.1 Schedule

The Contractor shall develop a schedule for this project using a Gantt chart. The schedule shall outline proposed dates for document submittals and work activities. The schedule shall be reviewed and approved by TEAD POCs and USACE technical team. The Contractor shall coordinate all scheduling deviations with the USACE Contracting Officer's Representative (COR).

2.1.2 Contractor Quality Control

The Contractor shall implement a comprehensive quality control (QC) program to ensure that all work on the project, including that of subcontractors and vendors, complies with the requirements of the contract. The quality control will make use of a three-phase control approach as described below:

- Preparatory Phase: before initiation of each definable item of the work, a comprehensive review of all essential elements contributing to the completion of that item must be undertaken. Subjects for the review include documents, materials, testing procedures, permits and approvals, hazard potentials, and an examination of the site.

- Initial Phase: at the inception of each definable feature of work, the methods, workmanship, testing procedures and safety practices being employed in the conduct of that work must be reviewed.
- Follow-up Phase: daily checks must be made to ensure the continued compliance of ongoing work. Final follow-up quality control inspections will be conducted for each completed feature of work before any follow-on work is begun.

The documentation and materials used to establish quality control in each phase may be audited by USACE to assure proper procedures are in place.

A Contractor Quality Control Plan (CQCP) will be prepared by the Contractor in accordance with the USACE specifications. The plan will describe the site-specific components of the quality control program including the personnel, procedures, controls, instructions, tests, records, and forms to be used, and shall be submitted by the Contractor to USACE and UDEQ for review and approval.

2.1.3 TEAD Hazardous Waste Management Program

The Contractor is required to have at least one employee on site at all times that has completed the 4-hour TEAD Hazardous Waste Management Program. Participation in this class must be coordinated with Dean Reynolds at the TEAD Environmental Office (EO).

2.1.4 Site Safety and Health Plan (SSHP)

The Contractor shall develop a SSHP that addresses all safety and health issues pertaining to work activities, particularly hazardous components. The SSHP shall address all safety and health issues described in the attached Health and Safety Design Analysis (HSDA).

All Contractor personnel must be familiar with the requirements of the SSHP. No Contractor personnel will be allowed within the construction zone without having completed the 40-hour Health & Safety Training for Hazardous Waste Workers and a current 8-hour refresher certificate, if required. The SSHP shall be submitted by the Contractor to USACE for review and approval.

2.1.5 Dust Control Plan

The Contractor shall prepare a Dust Control Plan detailing the methods to be used to control dust during field activities and when hauling soils, and submit it to USACE for review and approval.

2.1.6 Spill Prevention Plan

The Contractor shall prepare a Spill Prevention Plan discussing, at a minimum; the measures to be taken to prevent accidental spills of hazardous material and hazardous wastes, the measures to be taken to prevent erosion of stockpile soils and to contain contaminants in the stockpiles, and the cleanup procedures to be used in the event of an accidental spill. The Contractor shall submit the Spill Prevention Plan to USACE for review and approval.

2.1.7 Site Security Plan

The Contractor shall prepare a Site Security Plan for this site and submit it to USACE for review and approval. The plan shall include all aspects of site security and access.

2.2

Analytical Laboratory Acquisition

The Contractor is required to retain the services of an analytical laboratory to perform analysis associated with the remedial action at SWMU 25. The laboratory is required to be certified by the State of Utah and validated by the USACE. USACE has contracted a Quality Assurance (QA) laboratory, Severn Trent Laboratory in West Sacramento, California, for analysis of QA split samples.

2.3 TEAD Security Passes

All Contractor personnel required on site must be American citizens or in possession of a valid green card. This is required because these personnel must obtain security passes from the Installation Security Office. The Contractor must arrange to meet TEAD personnel during their initial visit in order to obtain security passes. Passes must also be secured for all vehicles used at the site. The USACE on site representative, Carl Cole at (435) 833-3331, can assist in this process.

2.4 Permits

The Contractor shall obtain an excavation permit from the Directorate of Public Works and Logistics, Tooele Army Depot. Prior to the start of excavation, this permit will be approved by appropriate divisions within TEAD, including the Utilities Division, Communications Contractor, Coaxial Cable Manager, Chief Environmental Office, and Director Public Works and Logistics.

Additionally, the contractor will be required to obtain a camera permit from the Directorate of Ammunition Operations prior to the start of work.

2.5 Utilities

The Contractor is responsible for providing power, water, sanitation, and any other facilities required at the site. Prior to the start of work, the Contractor will enter into a service agreement with the Directorate of Public Works for utilities provided. The Contractor shall reimburse TEAD for any utilities provided by the installation. All costs to connect to and disconnect from TEAD utilities are the responsibility of the Contractor.

2.6 Hazardous Waste Transportation

The TEAD EO oversees the shipment of hazardous waste on or off depot. No one shall accept hazardous waste from off depot or ship waste off depot unless approved in advance by the EO. The EO will coordinate all such approvals with the Command Group. The contractor shall submit the waste-shipping manifest and associated documentation (i.e. profiles, land disposal requirements (LDRs), VOC certifications, waste characterization analytical results, etc.) to the TEAD EO for review and approval 21 days prior to the scheduled hazardous waste pickup. The approval process for the manifest is greatly facilitated with a meeting at the EO.

All shipments either on or off depot must be accomplished using a properly completed hazardous waste manifest. The manifest must designate the name of the generator, transporter, and the facility receiving the waste. The base commander is considered the generator for the purpose of completing a uniform hazardous waste manifest with regard to waste generated by or on TEAD. The EO will identify those individuals who will be authorized to sign manifests either to receive waste or for shipment off depot.

All off-site transportation of hazardous waste must comply with Department of Transportation (DOT) regulations with respect to packaging, labeling, marking, and transportation of the wastes (49 Code of Federal Regulations (CFR) Parts 171-179).

2.7 Daily Paperwork

2.7.1 Field Log

The field logbook shall be labeled on the front cover with the project name and number, subcontractor name and client name, the start date, documentation of daily tailgate safety meetings, and when complete, the finish date. Field log books shall contain at a minimum the information contained in section 1.5.1.1 (log book procedures) of the TEAD Chemical Data Quality Management Plan (CDQMP) and must follow the procedures for documenting field activities presented in Standard Operating Procedure (SOP) 1.2 of the CDQMP.

2.7.2 Photo Log

Photographs shall be taken at each excavation site. The photographs shall include, at a minimum, pre-construction conditions, excavation procedures, sampling procedures, the excavation at its maximum depth, and the restored site.

2.7.3 Daily Report

A daily report shall be maintained by the Contractor's QC personnel. The report shall include, at a minimum, all activities undertaken at all of the sites, including the time and date undertaken, visitors at the sites, problems encountered and resolution, deviations from the approved work plan, excavation and sampling equipment used, and names and roles of Contractor's personnel at the site.

2.8 Waste Disposal Certificate

A waste disposal certificate shall be obtained from the receiving facility for each truckload of soil. The receipt shall include the date and time of receipt and the quantity received. Copies of the Waste Disposal Certificates shall be included in the Corrective Measures Completion Report (CMCR).

2.9 Corrective Measures Completion Report

After the completion of all corrective measures, the Contractor shall prepare a CMCR of all work performed. The CMCR shall be submitted to the USACE for review and approval, prior to submittal to UDEQ. The CMCR shall include, at a minimum:

- A summary describing work performed with details of any deviations from the RAP,
- As-built drawings showing the limits and depths of excavations,
- Descriptions of any problems encountered during the progress of the work and actions taken to resolve the problems,
- Attachments containing a complete photo log of the work accomplished,

- Copies of daily field logs and daily reports as documentation of field activities, including safety meeting documentation.
- All manifests prepared for disposal of excavated soils,
- All analytical results.

A Quality Control Summary Report (QCSR) shall be prepared as an attachment to the CMCR. The QCSR shall present an assessment of the adequacy of the chemical data. The assessment shall evaluate if the data is useable for determining if all soils containing concentrations of the COCs above the CAOs have been removed. All analytical results and validation reports shall be included in the QCSR.

3.0 TECHNICAL REQUIREMENTS

3.1 General

The Contractor shall carry out the activities described in this CMWP. USACE personnel will perform QA oversight. The Contractor shall have QC personnel on site at all times. Corrective measures activities at the site include:

- Installing a permanent gate in the exiting fencing;
- Performing waste characterization sampling;
- Excavating approximately 300 yd^3 to a depth of one-foot;
- Collecting confirmation soil samples;
- Excavating additional soil and collecting additional confirmation soil samples if any of the initial round of confirmation soil samples contain concentrations of lead or thallium in excess of their respective CAOs;
- Regrading the excavated areas to maintain grade and flow lines; and
- Transporting the excavated soil to a treatment, storage or disposal facility (TSDF) or landfill facility.

3.2 Pre-Mobilization Activities

Prior to mobilization, the Contractor shall coordinate with USACE and TEAD EO to determine appropriate staging areas and location of a permanent gate on the existing fence. The Contractor shall install and attach one permanent metal gate onto the existing fence. The Contractor shall follow the approved Haul Route (Figure 2) during the entire remediation activity. The Contractor shall obtain all necessary permits for excavation and photography at TEAD by contacting the Director of Public Works and the Directorate of Ammunition Operations for TEAD.

3.3 Site Security

The Contractor shall clearly mark and secure all work zones at all possible locations of entry to prevent public exposure to remedial action hazards. The Contractor shall install a permanent gate into the existing fencing at the site. If all construction-related activity cannot be confined to the area within the existing fence, the Contractor shall enclose the work area with a temporary, livestock-proof, livestock-safe fence to protect public health and animals from construction-related hazards and any equipment left unattended during the entire duration of the remedial activities: 24 hours a day, 7 days a week.

Additional security measures, other than the security fence, will be employed around the excavation and stockpile areas including barricades or construction fencing around excavations, caution tape around potentially dangerous areas, and safety signs throughout the construction area.

3.4 Protection of Existing Structures and Utilities

Any surface or subsurface infrastructure and utilities shall be protected during the soil excavation and site cleanup activities. Any damages to existing structures and utilities shall be corrected to the original conditions or as approved by the COR at no cost to the Government.

3.5 Excavation

The excavation location will be marked in the field by the USACE prior to mobilization. If necessary, the Contractor shall secure the work area and staging areas prior to excavation of soil. Six- to twelve inch berms shall be created using native soil to prevent stormwater run-on to the excavation area during field activities. The Contractor shall excavate soil from along approximately 250 linear feet of the drainage ditch (Figure 3), using standard heavy equipment. The Contractor shall initially excavate the middle 15 feet of the ditch. The initial depth of the excavation shall be one-foot bgs. The in-situ volume of the initial excavation is approximately 300 yd^3.

3.6 Waste Characterization and Disposal

Prior to excavation, the area to be excavated shall be divided into 20-foot by 70-foot grids (decision units), totaling approximately 50 cubic yards per grid. The Contractor shall collect characterization samples from each grid to confirm or deny whether the soils to be disposed of are compliant with RCRA land disposal restrictions. One five-point composite soil sample will be collected from each grid block systematically for disposal purposes. Each grid shall be evaluated separately for disposal characterization. Samples shall be collected from multiple depths and lateral locations to adequately characterize the soil and allow for over-excavation (laterally or vertically), if necessary. Stockpile characterization samples will be collected using decontaminated polyethylene trowels or stainless steel spoons, composite mixed, and placed into 8-ounce, wide-mouth glass jars. The samples will be shipped to a designated analytical laboratory for disposal characterization. This approach shall facilitate direct loading and disposal following excavation, and will prevent any material storage at the site. Additional information regarding soil sampling and analysis is provided in the SAP. Following excavation and disposal, the Contractor shall obtain a disposal certificate from the selected disposal site and include a copy in the CMCR.

3.7 Confirmatory Sampling

Soil samples will be collected to determine if the excavation has removed all soil containing concentrations of lead and thallium above their respective CAOs. Following the initial excavation of the drainage ditch (250’ x 15’ x 1’), composite soil samples will be collected from the floor and sidewalls of the excavation. The excavation will be divided up into five 50- by 15-foot grid blocks. Confirmation soil sampling locations are provided on Figure 4.

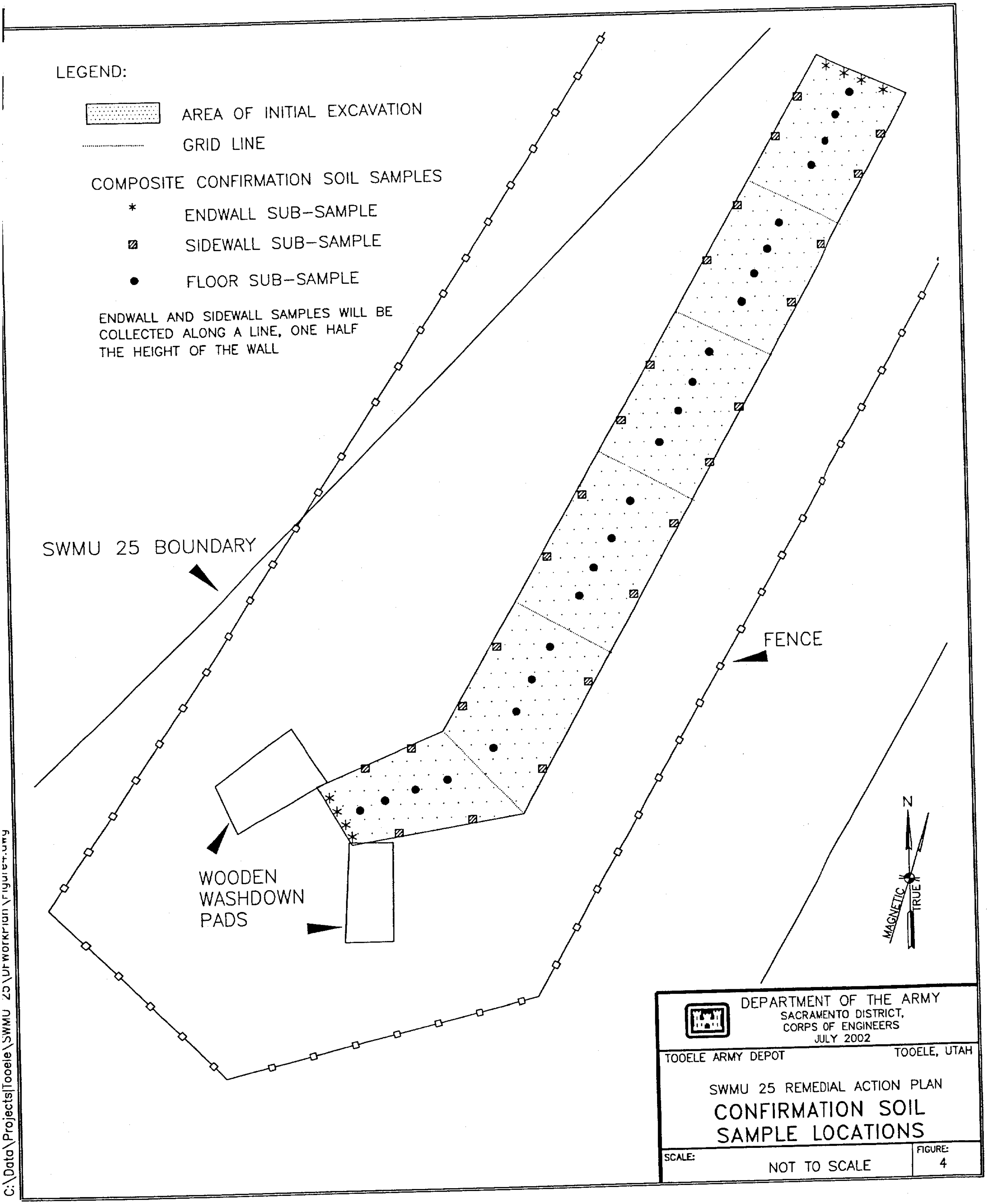
3.7.1 Floor Sampling

The floor of the excavation shall be divided into five 15-foot by 50-foot grids. One four-point composite shall be collected from the floor of each grid block (i.e. four sub-samples collected from the centerline of the 50-foot section of ditch, one every 12.5 feet, and mixed). Because of the source of the contamination, it is assumed that the maximum concentrations of COCs occur along the centerline of the outfall ditch. The analytical results of the composite soil sample shall apply to the entire grid block and decision rules shall be applied accordingly. Confirmation soil samples shall be analyzed for total lead and thallium. In the event that analytical results of the confirmation soil samples indicate that residual concentrations of the COCs remain in excess of their respective CAOs, the entire grid block shall be over-excavated one additional foot in depth (for a total of two-feet below ground surface) and one additional four-point composite soil sample shall be collected, as described above. This process shall continue until residual concentrations of the COCs are below their respective CAOs.

3.7.2 End-wall/Sidewall Sampling

Upon completion of the excavation, one four-point composite sample shall be collected from the end-wall closest to and farthest away from the discharge pipe (northeast and southwest extents of the excavation). The four sub-samples shall be collected from each excavation end-walls, along a line, approximately one-half the height of the walls, systematically covering the 15-foot width of the end-wall. If the confirmation soil sample collected from either the northeast or southwest end-wall contains concentrations of the COCs in excess of their respective CAOs, the excavation will be lengthened by five-feet from the end-wall that contained the COCs in excess of their CAOs. This process shall continue until residual concentrations of the COCs are below their respective CAOs.

Additionally, one four-point composite soil sample will be collected from the northwest and southeast sidewalls of each grid block, two from each side along a line, approximately one-half the height of the walls, for a total of five composite sidewall samples. Because of the apparent symmetry of the contaminated area, two samples from each sidewall of the grid block will be collected and composited together. The analytical results of the composite soil sample


LEGEND:
AREA OF INITIAL EXCAVATION
GRID LINE
COMPOSITE CONFIRMATION SOIL SAMPLES
* ENDWALL SUB-SAMPLE
SIDEWALL SUB-SAMPLE
FLOOR SUB-SAMPLE
ENDWALL AND SIDEWALL SAMPLES WILL BE COLLECTED ALONG A LINE, ONE HALF THE HEIGHT OF THE WALL
SWMU 25 BOUNDARY
FENCE
WOODEN WASHDOWN PADS
N
MAGNETIC
TRUE
DEPARTMENT OF THE ARMY
SACRAMENTO DISTRICT, CORPS OF ENGINEERS
JULY 2002
TOOELE ARMY DEPOT
TOOELE, UTAH
SWMU 25 REMEDIAL ACTION PLAN
CONFIRMATION SOIL SAMPLE LOCATIONS
SCALE: NOT TO SCALE
FIGURE: 4

shall apply to both sidewalls of a given grid block and decision rules shall be applied accordingly. If the confirmation soil sample from the sidewalls of any given grid block contain concentrations of the COCs in excess of their respective CAOs, that grid block will be widened by two feet on both sides, for a total of four feet wider than the initial excavation, to a depth of one foot below ground surface. This process shall continue until residual concentrations of the COCs are below their respective CAOs.

3.8 Surveying

A state-licensed surveyor shall survey the excavated areas and confirmatory sampling points and as-built drawings shall be produced indicating the corners of the excavation, and location of confirmation sampling points. The *in situ* volume of the excavation shall be determined from this survey. The corners of the excavation shall be surveyed at the existing ground surface and at the bottom of the excavation.

The survey shall use control points established by the USACE. The monuments are 5/8" rebar posts at ground level capped with a yellow USACE marked survey marker. These control points are listed in the following table. Survey coordinates are in the NAD 83 Utah Central system. The survey shall meet the requirements of a third order survey. Details regarding accuracies required for a third order survey are provided in EM-1110-1-1005.

	LOCAL	LOCAL	NAD 83 SPC	NAD 83 SPC	NAD 83 SPC	NAD 83 SPC	Description
POINT NO.	NORTHING	EASTING	USFT NORTHING	USFT EASTING	M NORTHING	M EASTING	
513	6228.047	9041.997	7354445.473	1392703.521	2241639.463	424496.882	SWMU corner
514	6528.348	9250.584	7354745.695	1392912.055	2241730.971	424560.443	SWMU corner
515	6526.717	9427.086	7354744.064	1393088.510	2241730.474	424614.227	SWMU corner
516	6369.449	9499.612	7354586.838	1393161.017	2241682.551	424636.327	SWMU corner
525	1475.562	10140.254	7349694.241	1393801.479	2240191.285	424831.540	Monument
526	1439.938	7545.532	7349658.631	1391207.442	2240180.431	424040.876	Monument
532	1462.606	9196.537	7349681.290	1392858.020	2240187.338	424543.974	Reference
533	6085.302	9181.061	7354302.766	1392842.549	2241595.966	424539.258	Building Corner
534	6025.884	9196.537	7354243.363	1392858.020	2241577.860	424543.974	Building Corner

3.9 Site Restoration

When all of the analytical results of confirmation sampling indicate that COC concentrations are below the CAOs, the Contractor shall grade the excavated areas to ensure proper drainage flow lines. This will most likely involve movement of soil from unexcavated areas within the drainage channel downstream of the excavated areas (to ensure continued drainage), but no borrowed material from outside the drainage channel is anticipated. If significant over-excavation is required (i.e. creating a trench greater than three feet deep), backfill may be required to prevent health and safety hazards. Backfill material shall be obtained from an off-post source willing to certify in writing that the material is from a natural source and has not been previously used in or exposed to any industrial processes.

4.0 REFERENCES

Dames & Moore, 2000, *Final Planning Documents, Known Releases SWMUs, Tooele Army Depot, Tooele, Utah, Corrective Measures Study Work Plan.*

Dames & Moore, December 2001*, Final Known Releases SWMUs 3, 11, 25, and 30 Corrective Measures Study Report, Tooele Army Depot, Tooele Utah.*

Rust E&I, 1995, *Final RCRA Facilities Investigation Report Phase II Study Known-Releases SWMUs, Tooele Army Depot - North Area, Tooele, Utah.*

Rust E&I, 1997, *Tooele Army Depot-North Area Final Site-Wide Ecological Risk Assessment,* prepared for US Army Environmental Center, Aberdeen Proving Grounds, Maryland.

UDEQ, 1999, *Utah Hazardous Waste Post Closure Permit for Post-Closure Monitoring and Corrective Action of the Industrial Waste Lagoon for The Tooele Army Depot (North Area).*

SAMPLING AND ANALYSIS PLAN

SWMU 25 - CHARCOAL MATERIAL AREA

TOOELE ARMY DEPOT

TOOELE, UTAH

Final

Prepared for:

Tooele Army Depot
Environmental Office

Prepared by:

U.S. Army Corps of Engineers
Sacramento District

July 2003

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TABLES

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ACRONYMS AND ABBREVIATIONS

bgs	below ground surface
CAO	Corrective Action Objective
CAP	Corrective Action Plan
CDQMP	Chemical Data Quality Management Plan
CMS	Corrective Measures Study
COC	Contaminant of Concern
EPA	Environmental Protection Agency
FSP	Field Sampling Plan
IDW	Investigation-Derived Waste
mg/k	milligram per kilogram
mg/L	milligram per liter
POC	Point of Contact
QA/QC	Quality Assurance/Quality Control
RA	Remedial Action
RAP	Remedial Action Plan
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
Rust E&I	Rust Environmental & Infrastructure
SAP	Sampling and Analysis Plan
SOP	Standard Operating Procedure
SWMU	Solid Waste Management Unit
TCLP	Toxicity Characteristic Leaching Procedure
TEAD	Tooele Army Depot
TSDF	Treatment, Storage, and Disposal facility
USACE	United States Army Corps of Engineers
UDEQ	Utah Department of Environmental Quality

SAMPLING & ANALYSIS PLAN

SWMU 25 – FORMER BATTERY SHOP

TOOELE ARMY DEPOT, TOOELE, UTAH

1.0 INTRODUCTION

This Sampling and Analysis Plan (SAP) is prepared for SWMU 25, Battery Shop in accordance with the Corrective Measures Study (CMS) Work Plan, Tooele Army Depot (TEAD) (Dames & Moore, February 2000). This SAP covers the requirements for conducting the sampling and analytical procedures necessary to achieve the recommended alternative for the remedial action (RA) specified in the CMS; excavation, off-post treatment and/or disposal of contaminant of concern (COC)-containing soil, and land use restrictions. This SAP is one component of the Corrective Measures Work Plan (CMWP); the CMWP also contains a Remedial Action Plan, describing the remediation procedures to be performed at the site, and a Health and Safety Design Analysis, which describes health and safety requirements for protection of both the workers on the site and the surrounding community during the site work at SWMU 25. All sampling and analysis shall be performed in accordance with the Chemical Data Quality Management Plan (CDQMP) TEAD, Final, June 1999 (USACE, 1999).

2.0 PROJECT ORGANIZATION

A detailed discussion of the project organization is presented in Section 1.1 of the TEAD CDQMP. The identification of regulatory and TEAD points of contact (POC), and key USACE staff related to this SAP is presented in Section 1.6 of the RAP.

3.0 PROBLEM DEFINITION/BACKGROUND

A description of SWMU 25 and its history are supplied in Section 1.2 of the RAP. Soil samples were collected during Phase II Resource Conservation and Recovery (RCRA) Facility Investigation (RFI) (Rust E&I, 1995). Based on the human health risk assessment presented in the RFI report, arsenic, lead and thallium have been detected at levels in excess of the depot worker corrective action objectives (CAOs) in surface soils near Discharge Areas (washdown pads and drain pipe); however, only lead and thallium were determined to present unacceptable risks to on-site workers. The CAOs and risk concentrations (called exposure point concentrations) were identified in the CMS Work Plan (Dames and Moore 2000).

No groundwater monitoring was conducted at SWMU 25. According to the Phase II RFI Report, SWMU 25 constituents are not likely to affect groundwater quality based on the general decrease in contaminant concentrations with depth, tendency of the contaminants to strongly adsorb to the soil, low precipitation rates, and depth to groundwater.

The selected remedy for the former Battery Shop at SWMU 25 is excavation of surface soils, off-post treatment and/or disposal, and land use restrictions to prevent residential development.

4.0 PROJECT DESCRIPTION

This SAP describes the sampling and analytical methods that will be implemented during the RA at SWMU 25 within TEAD. This project includes excavation of surface soils and off-post treatment/disposal of soil that contains lead and thallium at concentrations in excess of their respective CAOs.

The soil along the drainage ditch will be excavated to approximately one foot below ground surface (bgs), as described in Section 3.5 of the RAP. Confirmation samples will be collected to measure remaining lead and thallium concentrations. The contaminated soil will be excavated using standard heavy excavation equipment and placed in roll-off bins. The soil in the bins shall be collected and analyzed to determine proper disposition. The possibilities are for the soils to be pre-treated at a treatment facility and/or disposed of at a Subtitle C or D landfill. The soil shall be transported and manifested in compliance with applicable regulations.

5.0 DATA QUALITY OBJECTIVES

5.1 State the Problem

Concentrations of lead and thallium in excess of their respective CAOs have been detected in surface soils inside the drainage area near the pipe as indicated in Figure 2 of the RAP. The recommended corrective measures alternative is excavation of contaminated soil, off-post treatment and/or disposal, and land use restrictions. Neither excavation nor off-post treatment/disposal is expected to present administrative or technical difficulties. The equipment and materials required for implementation of this alternative are readily available. Subtitle D and Subtitle C landfills are both located within 100 miles of TEAD.

5.2 Identify the Decisions to be Made

Confirmation soil sampling will be required to answer the following question:

1) Do the soils left in place contain lead or thallium at concentrations above CAO limits?

Excavated soil sampling will be required to answer the following question:

2) Where will the excavated soil be disposed – a Subtitle D or Subtitle C facility and will the soil need to be treated prior to disposal at the Subtitle C facility?

5.3 Identify the Inputs to Decisions

Decision Number	Information needed	Location of information	Comparison Criteria	Analytical Method(s)
1	Soil concentrations of total lead and thallium	Collecting samples at the bottom and sides of the excavation	Corrective Action Objectives (CMS Work Plan)	Environmental Protection Agency (EPA) Method 6010B
1	SWMU characterization data	Phase II RFI (Rust E&I, 1995)	CAOs	EPA Method 6010
2	Concentrations of constituents for Subtitle D landfill disposal	Collecting one composite sample from each stockpile of excavated soil	Disposal requirements listed in Table 3	EPA Methods 6010B, 7470A, 9045C, and 1311, if needed

5.4 Definition of Project Boundaries

The proposed excavation is approximately 350 feet long, 15 feet wide, and one foot (12 inches) deep. The estimated area of the excavation is approximately 5,200 square feet. As shown in Figure 2 of the RAP, this area is adjacent to the underground pipe and wash down pads.

Upon completion of the initial round of excavation, confirmation soil samples will be collected. The excavation will be divided up into seven 50- by 15-foot grid blocks. Confirmation soil sampling locations are provided on Figure 4 of the RAP. One four-point composite floor sample (four equally spaced sub-samples collected along the centerline of the ditch) and one four-point composite sidewall sample (two equally spaced sidewall sub-samples from each side of the grid) shall be collected from each grid. Additionally, one four-point composite sample shall be collected from each endwall (closest to and furthest from the discharge pipe) of the excavation. Together, these samples will represent the soil remaining at SWMU 25. Confirmation soil samples will be collected within 24-hours of the completion of excavation and results will be reported within 24 hours. If confirmation soil samples contain concentrations of total lead or thallium in excess of their respective CAOs, additional excavation will be performed and additional confirmation soil samples will be collected.

Excavated soil will be placed into 100 cubic yard stockpiles. One four-point composite sample will be collected from each stockpile to represent the soil contained in that stockpile. The sample collection timeframe must be short enough from the time of excavation that the soil is disposed within the 90-day RCRA limit. The fixed laboratory turnaround time will be 2 weeks.

5.5 Develop Decision Rules

The purpose of the on-site confirmation testing is to determine if further excavation is required.

- If all confirmation soil samples contain concentrations of both lead and thallium below their respective CAOs, as specified in the CMS, the excavation will be considered complete and restoration will continue as described in Section 3.10 of the RAP.

- If any of the confirmation soil samples contain concentration of lead or thallium in excess of their respective CAOs, as specified in the CMS, over-excavation will be performed as described in Section 3.7 of the RAP and additional confirmation samples will be collected. This will continue until the lead and thallium concentrations left in place are below their respective CAOs.

The intent of the waste characterization sampling is to determine the appropriate facility for disposal of the excavated soil. The decision process developed for soil stockpile samples is presented in Section 3.8 of the RAP.

5.6 Specify Limits on Decision Errors

The decision error inherent in selecting sampling locations and analyzing chemicals in soils consists of potential errors in sample design, location and sample analysis.

- The lead and thallium composite sample confirmation results will represent specified areas of the vertical and horizontal extent of contamination (see section 5.4 above).

- The availability of defensible historical analytical data should reduce the probability of sample design and location errors.

- For waste characterization sampling, a discrete soil sample shall be collected at four equally spaced intervals within each stockpile, midway between the top and the bottom of the pile and composite-mixed into one sample container to be submitted for chemical analysis. This sampling approach should provide for a representative sample assessment of the constituents present and reduce the probability of sample design and location errors.

- Any decision errors, resulting from analytical errors, will be evaluated during the data review, evaluation and validation process. Data found outside of acceptance criteria during validation will be qualified as estimated or rejected, as appropriate. The nature of the deficiency and the proximity to the associated action level will be used to assess the usability of the data. Adherence to quality control protocols should reduce the probability of analytical errors.

5.7 Optimization of Design

Samples are being collected to address each decision in Section 5.2. The sample designs differ due to the differing objectives. Each sample design is described below. A USACE validated, State of Utah certified laboratory that has undergone extensive audits and performance evaluations shall be used for all chemical testing.

Confirmation Sample Design

The confirmation samples are being collected to verify that lead and thallium concentrations remaining in soil after excavation are below their respective CAOs, as specified in the CMS. The most resource effective data collection design was developed using data from previous investigations performed at SWMU 25 and the requirements specified in the CMS.

For confirmation sampling, a systematic, linear sampling approach shall be used, based on the results of prior investigations, to minimize the risk of false negatives. Presumptions based upon the previous investigations that led to the selection of confirmatory sampling locations are 1) the centerline of the ditch is the deepest and most contaminated; 2) the ditch was predominantly the wastewater carrier; and 3) contaminants were deposited equally on both sides of the ditch. The excavation area shall be divided into seven 50- by 15-foot grids; one composite floor sample and one composite sidewall sample will be collected from each grid. The sample grids and sampling locations are illustrated in Figure 4 of the RAP. Each composite floor sample is comprised of four equally spaced sub-samples collected from the bottom of the excavation along the centerline of each 15- by 50-foot grid and mixed. Each composite sidewall sample will be comprised of four sub-samples, two from each sidewall of the grid, equally spaced samples along a line, one-half the height of the sidewall. This strategy is based upon the apparent symmetry of the contaminated area. Composite sampling points for the endwalls (closest to and furthest from the outfall) of the excavation shall consist of four individual sampling locations along each endwall equally spaced horizontally along a line one-half the depth of the excavation to represent horizontal extent of contamination at the northeast and southwest ends of the excavation.

Confirmation samples will be collected and sent to a fixed laboratory for analysis of lead and thallium using EPA Method 6010B. The laboratory analysis turnaround time will be 24 hours to minimize the standby time and eliminate the need for remobilization. Data will be reported on a dry weight basis.

Waste Characterization Sample Design

One four-point composite sample will be collected from each 100 cubic yard stockpile containing excavated soil for waste characterization. A systematic sampling approach will be used to collect the individual samples. Each composite sample will be considered representative of the soil in that stockpile. The sample will be analyzed for TCLP metals (see Table 3) on a two-week turnaround time.

6.0 SAMPLING PROCESS DESIGN

The sampling process design is described in Section 5.7, Step 7 of the DQO process, Optimize the Design for Obtaining Data. An equipment rinsate blank will also be collected to demonstrate the efficiency of decontamination procedures whenever non-disposable sampling equipment is used. Field duplicate samples will be collected during confirmation sampling to demonstrate overall sampling precision. Quality Assurance “split” samples will be collected and sent to a USACE-contracted and approved laboratory. The selected USACE-contract laboratory for this project is Severn Trent Laboratories in West Sacramento, California. A summary of the primary and quality assurance/quality control (QA/QC) samples to be collected and analyzed for this project is summarized in Table 1.

7.0 SAMPLING METHODS REQUIREMENTS

Discrete (grab) samples will be collected using the guidance from Section 3.7 of the Field Sampling Plan (FSP), located in the CDQMP, Tooele Army Depot. The sample is obtained by scooping the soil using a decontaminated stainless steel or disposable trowel or spatula, and depositing the soil in a glass jar.

To form a composite sample, several locations are sampled. All soil samples at each of the locations to be composited are emptied into a decontaminated stainless steel mixing container. The soil is thoroughly mixed and placed into sample jars, sealed, labeled, and logged on a Chain of Custody. All sample compositing will follow the procedures outlined in Standard Operating Procedure (SOP) 3.2.

Samples shall be collected in accordance with the SOPs specified in Appendix D and as follows:

SOP No.	SOP Title
1.0	Quality Control Program
1.1	Chain of Custody
1.2	Field Activity Documentation
2.0	Sample Handling Packaging and Shipping
2.1	Sample Labeling
2.2	Sample Numbering
2.3	On-Site Sample Storage
3.0	Surfaces and Shallow Subsurface Soil Sampling
3.2	Composite Soil Sampling
3.3	Duplicates and Split Sample Preparation
6.0	Field Equipment Decontamination
12.0	Soil Stockpiling
15.0	Field QC Sampling
16.0	Management of Investigation Derived Waste

Sample containers, preservation and holding time requirements are specified in Table 2 of this SAP.

8.0 ANALYTICAL METHODS SUMMARY

Definitive level data is required for this project. Samples shall be analyzed using the latest EPA promulgated SW-846 methods of analysis. Analytical methods descriptions, QA/QC acceptance criteria and corrective actions are detailed in the TEAD CDQMP. The following EPA methods of analysis are required for this project:

Description	**EPA Method**
Metals by Inductively Coupled Plasma (ICP)	SW6010B
Mercury by Cold Vapor Atomic Absorption	SW7470A
Acid Digestion of Soils for Analysis by ICP*	SW3050B
Toxicity Characteristic Leaching Procedure (TCLP)	SW1311
Acid Digestion of Waters and Leachates for Analysis by ICP*	SW3010A

* Preparation Methods

A summary of the required target analytes, practical quantitation limits (PQLs), CAOs, and TCLP threshold levels specific to this SWMU are presented in Table 3.

9.0 INVESTIGATION-DERIVED WASTE

Investigation-derived waste (IDW) generated during sampling activities (e.g., water used to decontaminate sampling equipment) shall be collected and handled in accordance with SOP 16.0, Management of Investigation Derived Waste. The IDW quantity is anticipated to be small; therefore, it will be stored in a container on-site and will be disposed of with the excavated soil.

10.0 QUALITY ASSURANCE/ QUALITY CONTROL

Project QC for sampling and analysis shall be consistent with the requirements specified in the TEAD CDQMP. In addition, QA split samples of the final confirmation samples shall be collected and sent to a separate USACE-contracted and validated, State of Utah-certified laboratory that has undergone extensive audits and performance evaluations for verification of the confirmation sample results. Ten percent of the final confirmation samples will be selected for QA splits. The QA split samples are the main tool to determine that the data generated by the primary laboratory is technically valid and of adequate quality for closure.

11.0 REFERENCES

Dames & Moore, February 2000, *Known Releases SWMUs Corrective Measures Study Report, Tooele Army Depot, Tooele, Utah.* Prepared for Tooele, Army Depot Tooele, Utah.

Rust E&I, August 1995, *Final Draft RCRA Facilities Investigation Report Phase II Study Known Releases SWMUs Tooele Army Depot – Tooele Army Depot-North Area, Tooele, Utah.*

U.S. Army Corps of Engineers (USACE), 1999, *Chemical Data Quality Management Plan (CDQMP), Final, Tooele Army Depot, Tooele Utah, Revision 2.*

U.S. Environmental Protection Agency, December 1996. *Test Methods for Evaluating Solid Waste*, SW-846, Third Edition.

Tables

TABLE 1: Primary and QA/QC Sample Summary

Objective	Parameter	Approximate Number of Primary Samples	Field Duplicates	MS/MSD[1]	Equipment Blanks
Confirmation Samples	Total Lead and Thallium (ICP)	16 minimum	2	1	1[3]
Quality Assurance Split Samples	Lead and Thallium (ICP)	2	-	-	-
Excavated Soil	TCLP Metals (see Table 3)	3[2]	1	-	-

[1] Matrix Spike/Matrix Spike Duplicate
2 Assuming 100cubic yard stockpilles
3 If non-disposable sampling equipment is used

TABLE 2: Sample Containers, Preservation and Holding Times

Parameter	Method	Matrix	Container	Preservation	Holding Time
Toxicity Characteristic Leaching Procedure Extraction	SW1311	Soil	One 4-8 ounce wide mouth glass jar	Cool 4°C±2	14 days
Metals[1]	SW6010B	Soil	One 4-8 ounce wide mouth glass jar	Cool 4 °C±2	180 days
Mercury[1]	SW7471A	Soil	One 4-8 ounce wide mouth glass jar	Cool 4 °C±2	28 Days

[1] May be combined in one 1x8 ounce wide mouth glass jar

TABLE 3: Parameter, Method, Analyte List, Quantitation Limits (QL) and Comparison Criteria

Objective	Parameter/Method	Analyte	Soil QL (mg/kg)	Corrective Action Objective (mg/kg)	TCLP Extract QL (mg/L)	TCLP Limit (mg/L)
Confirmation	SW3050B/SW6010B	Lead	10	1,800		
	SW3050B/SW6010B	Thallium	1.0	120		
Soil Disposal	SW1311/SW3010A/SW6010B	Arsenic			1	5.0
		Cadmium			0.05	1.0
		Chromium			0.1	5.0
		Lead			1	5.0
		Silver			0.1	5.0
	SW1311/SW7470A	Mercury			0.005	0.2

QL Quantitation Limit
mg/kg milligrams per kilogram
mg/L milligrams per liter

HEALTH AND SAFETY DESIGN ANALYSIS
SWMU 25 – BATTERY SHOP
TOOELE ARMY DEPOT
TOOELE, UTAH

Final

Prepared for:

Tooele Army Depot
Environmental Office

Prepared by:

U.S. Army Corps of Engineers
Sacramento District

July 2003

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ACRONYMS AND ABBREVIATIONS

- ACGIH American Conference of Governmental Industrial Hygienist
- AHA Activity Hazard Analysis
- ANSI American National Standards Institute
- APR Air Purifying Respirator
- bgs Below Ground Surface
- BRAC Base Realignment and Closure
- CAP Corrective Action Permit
- CESPK U.S. Army Corps of Engineers-Sacramento District
- CFR Code of Federal Regulations
- CIH Certified Industrial Hygienist
- CMS Corrective Measures Study
- CMWP Corrective Measures Work Plan
- CO Contracting Officer
- COCs Chemicals of Concern
- CPR Cardiopulmonary Resuscitation
- CRZ Contamination Reduction Zone
- dB Decibels
- EPA Environmental Protection Agency
- EZ Exclusion Zone
- FFA Federal Facility Agreement
- HDPE High-Density Polyethylene
- HEPA High Efficiency Particulate Air
- HSDA Health and Safety Design Analysis
- HTRW Hazardous, Toxic, and Radioactive Waste
- IDLH Immediately Dangerous to Life or Health
- IRP Installation Restoration Program
- mg/kg Milligrams per Kilogram
- MSDS Material Safety Data Sheets
- NPL National Priorities List
- NIOSH National Institute of Occupational Safety and Health
- OE Ordnance and Explosives
- OSHA Occupational Safety and Health Administration
- PEL Permissible Exposure Limit
- PPE Personal Protective Equipment
- RAC Remedial Action Contractor
- RAP Remedial Action Plan
- RCRA Resource Conservation and Recovery Act
- REL Recommended Exposure Limit

- RELs Recommended Exposure Limits
- RFI RCRA Facility Investigation
- SSHO Site Safety and Health Officer
- SSHP Site-Specific Health and Safety Plan
- SWMU Solid Waste Management Unit
- TCLP Toxicity Characteristic Leaching Procedure
- TEAD Tooele Army Depot
- TSDF Treatment, Storage, and Disposal Facility
- TLV/TWA Threshold Limit Value/Time Weighted Average
- USACE United States Army Corps of Engineers
- USCG United States Coast Guard
- UXO Unexploded Ordnance
- yd3 Cubic Yards

HEALTH AND SAFETY DESIGN ANALYSIS

SWMU 25 – BATTERY SHOP

TOOELE ARMY DEPOT, TOOELE, UTAH

1.0 INTRODUCTION

A Health and Safety Analysis (HSDA) is used as the basis for developing Site-Specific Safety and Health Plans for work at hazardous, toxic and radioactive waste (HTRW) sites. Specifically, it provides the rationale and decision logic for the information to be addressed in the contractor's Site Safety and Health Plan (SSHP).

1.1 General

This HSDA provides safety and health criteria and practices to address protection of on-site personnel, the public, and the environment from physical and chemical hazards unique to the Corrective Measures Work Plan (CMWP) for Solid Waste Management Unit (SWMU) 25, known as the Battery Shop, located at the Tooele Army Depot (TEAD) in Tooele, Utah. The specific requirements of this HSDA will form the basis for a provision that requires the Remedial Action Contractor (RAC) to develop a detailed SSHP. Both the HSDA and the contractor SSHP follow the format provided in Appendix C of USACE ER 385-1-92, dated 1 September 2000. The resulting contractor SSHP will be reviewed and approved by the U.S. Army Corps of Engineers, Sacramento Division (CESPK) Contracting Officer (CO) prior to initiation of site field activities.

1.2 References

The contractor's SSHP and subsequent activities must comply with the following referenced documents, at a minimum:

a. Title 29, Code of Federal Regulations (CFR) 1926.65 (29 CFR 1910.120), *Hazardous Waste Operations and Emergency Response*.
b. 29 CFR 1926.62, *Lead*
c. USACE, *Safety and Health Requirements Manual*: EM 385-1-1. EM 385-1-1 and its changes are available at http://www.hq.usace.army.mil/soh/hqusace_soh.htm The Contractor shall be responsible for complying with the current edition and all changes posted on the web.
d. USACE, *Safety and Occupational Health Document Requirements for Hazardous, Toxic and Radioactive Waste (HTRW) Activities*: ER 385-1-92.
e. NIOSH/OSHA/USCG/EPA: *Occupational Safety and Health Guidance Manual for Hazardous Waste Activities*.

1.3 Deviation from SSHP

No deviations from the contractor's SSHP may be implemented without the prior notification and approval of the contractor's safety, and health manager and CO, except in case of emergency.

2.0 SITE DESCRIPTION AND CONTAMINATION CHARACTERIZATION

A detailed discussion of the site background and history is included in the Remedial Action Plan (RAP) section of this CMWP. Site background that is germane to the development of the SSHP is discussed in this section.

2.1 Location

TEAD is located in the Tooele Valley in Tooele County, Utah, directly west of the City of Tooele and approximately 35-miles southwest of Salt Lake City. TEAD occupies an area of approximately 24,732 acres and is bounded by the Stockton Bar and South Mountain to the south, by Grantsville and the Great Salt Lake to the north, by Tooele and the Oquirrh Mountains to the east, and the Stansbury Mountains to the west.

2.2 History

TEAD was established in 1942. Its original mission was the storage and maintenance of supplies, ammunition and vehicles. The current mission is the storage, maintenance and demolition of conventional ammunition. Because of past activities at the installation, TEAD was included in the U.S. Army's Installation Restoration Program (IRP) in 1978. TEAD was placed on the National Priority List (NPL) in 1990. A Federal Facility Agreement (FFA) was entered into between the U.S. Army, U. S. Environmental Protection Agency (EPA) Region 8, and the State of Utah in 1991. As a result of past operations and environmental investigations, a number of sites on the installation have been identified and designated as SWMUs and a Resource Conservation and Recovery Act (RCRA) Post Closure Permit was issued by the State of Utah in 1991. The permit expired in January 2001. A new RCRA Post Closure and corrective action permit (CAP) was issued to TEAD in February 2001. This CAP requires actions at 42 SWMUs. SWMU 25 is one of the 42 SWMUs identified in the CAP and has been incorporated in the Known Release SWMUs.

2.3 Site Description

SWMU-25, known as the former Batter Shop was used for maintenance and repair of vehicle and forklift batteries from 1980 to 1993. SWMU-25 includes the former Battery Shop (Building 1252), two washdown pads and a 350-foot long drainage ditch that previously received washdown runoff from the Shop. SWMU-25 is located north of East Workshop Road in the south central portion of TEAD (RAP, Figures 2 & 3). SWMU-25 is grassy and relatively flat.

2.4 Contaminant Characterization

Previous investigations identified arsenic, lead and thallium as chemicals of concern (COCs) at SWMU-25. Arsenic concentrations detected at the site are likely due to background soil variations, not to site-related contamination; thus, are not considered for further corrective measures. The Corrective Measure Study (CMS) concluded that excavation, off-post treatment/disposal and land use restrictions is the most appropriate remedy to address the elevated levels of lead and thallium.

Table 1 – Chemicals of Concern

COC	Maximum Concentration in Soil
Lead	33,251 mg/kg
Thallium	1,510 mg/kg

2.5 Extent of Contamination

The extent of contamination at SWMU 25 is shown on Figure 3 of the RAP as the diagonal striped area. The total area and volume of contaminated soil is estimated at 8,100 square feet and 300 cubic yards, respectively. The depth of contamination is approximately one-foot bgs.

2.6 Recommended Corrective Measures Alternative

The recommended remediation alternative for SWMU 25 is excavation with off-post treatment and disposal. A detailed description of the corrective action methods can be found in the RAP. This alternative has the following components:

1. Excavate 300 yd^3 of contaminated soil to a depth of one-foot bgs;
2. Stockpile excavated soil on and cover with high-density polyethylene (HDPE) of a thickness of at least 10/1000-inches (10 mil). The stockpile location will be prepared prior to the placement of the HDPE to prevent damage to the HDPE. Each soil stockpile will contain approximately 100 yd^3 of soil. Details regarding stockpile design are provided in Section 3.6;
3. Collect confirmation soil samples to ensure that concentrations of lead and thallium are below their respective CAOs. Soil sampling details are provided in Section 3.7 of this RAP and in the SAP;
4. Over-excavate, if confirmation soil samples indicate that remaining concentrations of lead and thallium remain in excess of the CAOs. Over-excavation will continue until remaining concentrations of lead and thallium are below their respective CAOs;
5. Collect characterization samples from the excavated soil for leachable metals analysis. Based on the results of the analysis, excavated soil will be transported off-post and treated/disposed of in accordance with U.S. Army protocol and Federal and State regulations; and
6. Regrading the excavated areas to maintain grade and flow lines.

3.0 HAZARD/RISK ANALYSIS

3.1 Safety Hazards

Safety hazards associated with the corrective measures work tasks include exposure to open excavations, heavy equipment operation, struck-by and caught between hazards with moving equipment and machinery, buried and overhead utilities, electrical connections, heavy lifting, slip, trip, falls on same surface and motor vehicles moving about the site. The contractor shall ensure that the controls implemented to address these safety hazards comply with applicable sections of EM 385-1-1.

3.2 Chemical Hazards

As listed in Table 1, Antimony and Lead are the only COCs. The routes of exposure that can be anticipated for the above listed tasks are inhalation of dry contaminated soil, direct skin contact with contaminated soil and incidental ingestion of airborne contaminated soil.

3.2.1 Established Exposure Values

The toxic hazards to site personnel associated with the suspected site contaminant can be assessed through comparison of actual exposures with several established occupational exposure limits: a) Permissible Exposure Limits (PELs) established by the Federal Occupational Safety and Health Administration (OSHA); b) Recommended Exposure Limits (RELs) established by the National Institute for Occupational Safety and Health (NIOSH); c) Threshold Limit Values/Time Weighted Averages (TLV/TWAs) established by the American Conference of Governmental Industrial Hygienists (ACGIH®); d) Immediately Dangerous to Life or Health (IDLH) values established NIOSH.

3.2.2 Occupational Exposure Limits

These occupational exposure limits are described as follows:

a. PELs are established by OSHA. PELs may be expressed as an 8-hour TWA or as a ceiling limit. Ceiling limits may not be exceeded at any time. PELs are enforceable by law.

b. RELs are developed by NIOSH. RELs are published guidelines that recommend employee exposure limits for airborne contaminants. RELs are expressed as a TWA or a ceiling limit.

c. The ACGIH TLV/TWA is defined as the airborne concentration of a substance to which nearly all workers (8 hours per day, 40 hours per week) may be repeatedly exposed, day after day, without experiencing adverse health effects. For some substances, the overall exposure to a substance is enhanced by skin, mucous membrane, or eye contact. These substances are identified by notation "S" following the TLV/TWA values. Other substances have a ceiling value "C", which may not be exceeded during any part of the working exposure.

d. IDLH: The maximum airborne concentration of a substance which one could escape within 30 minutes without escape-impairing symptoms or any irreversible health effects.

3.2.3 Exposure Limits and Toxicological Information

Table 2 and paragraph 3.2.4 – NIOSH Pocket Guide to Chemical Hazards presents occupational exposure limits and general physical and toxicological information for the site COCs including: OSHA PELs, NIOSH RELs, ACGIH TLV/TWAs, and IDLH values. Alternate workplace standards recommended in publications related to workplace exposure criteria, such as the TLVs and Biological Indices by the ACGIH, shall be used in lieu of OSHA standards where OSHA standards are less stringent or do not exist.

Table 2 – Occupational Health Exposure and Toxicological Properties for Contaminants of Concerns

COC	OHSA PEL mg/M^3	NIOSH REL mg/M^3	ACGIH TLV mg/M^3	IDLH mg/M^3
Lead	0.05	0.05	0.05	100
Thallium	0.1	0.1	0.1	15

3.2.4 NIOSH Pocket Guide to Chemical Hazards

Lead

NIOSH Pocket Guide to Chemical Hazards

Lead			**CAS** 7439-92-1
Pb			**RTECS** OF7525000
Synonyms & Trade Names Lead metal, Plumbum			**DOT ID & Guide**
Exposure Limits	NIOSH REL*: TWA 0.050 mg/m^3 [*Note: The REL also applies to other lead compounds (as Pb)]		
	OSHA PEL*: [1910.1025] TWA 0.050 mg/m^3 [*Note: The PEL also applies to other lead compounds (as Pb)]		
IDLH 100 mg/m^3 (as Pb)		**Conversion**	
Physical Description A heavy, ductile, soft, gray solid.			
MW: 207.2	BP: 3164°F	MLT: 621°F	Sol: Insoluble
VP: 0 mmHg (approx)	IP: NA		Sp.Gr: 11.34
Fl.P: NA	UEL: NA	LEL: NA	
Noncombustible Solid in bulk form.			
Incompatibilities & Reactivities Strong oxidizers, hydrogen peroxide, acids			
Personal Protection & Sanitation Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: Daily Remove: When wet or contaminated Change: Daily		**First Aid** Eye: Irrigate immediately Skin: Soap flush promptly Breathing: Respiratory support Swallow: Medical attention immediately	
Exposure Routes inhalation, ingestion, skin and/or eye contact			
Symptoms Lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; paralysis wrist, ankles; encephalopathy; kidney disease; irritation eyes; hypotension			
Target Organs Eyes, gastrointestinal tract, central nervous system, kidneys, blood, gingival tissue			

Thallium

NIOSH Pocket Guide to Chemical Hazards

Thallium (soluble compounds, as Tl)	**CAS**
	RTECS
Synonyms & Trade Names Synonyms vary depending upon the specific soluble thallium compound.	**DOT ID & Guide** 1707 151 (compounds, n.o.s.)

Exposure Limits	NIOSH REL: TWA 0.1 mg/m^3 [skin]
	OSHA PEL: TWA 0.1 mg/m^3 [skin]
IDLH 15 mg/m^3 (as Tl)	**Conversion**

Physical Description Appearance and odor vary depending upon the specific soluble thallium compound.			
Properties vary depending upon the specific soluble thallium compound.			
Incompatibilities & Reactivities Varies			

Personal Protection & Sanitation Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated Remove: When wet or contaminated Change: Daily	**First Aid** Eye: Irrigate immediately Skin: Water flush promptly Breathing: Respiratory support Swallow: Medical attention immediately
Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact	
Symptoms Nausea, diarrhea, abdominal pain, vomiting; ptosis, strabismus; peri neuritis, tremor; retrosternal (occurring behind the sternum) tightness, chest pain, pulmonary edema; convulsions, chorea, psychosis; liver, kidney damage; alopecia; paresthesia legs	
Target Organs Eyes, respiratory system, central nervous system, liver, kidneys, gastrointestinal tract, body hair	

3.2.5 Material Safety Data Sheets

The Contractor should include Material Safety Data Sheets (MSDSs) for each known or anticipated chemical brought to the site in support of the corrective measures work.

3.3 Physical Hazards

Physical hazards that can be anticipated for this project include: noise from operating equipment, fire from flammable material, range fires, excavation hazards, faulty electrical connections, and heat or cold stress (depending on the time of year). The contractor's SSHP should evaluate controls that can be implemented to lower the noise exposure during equipment operation as well as control for temperature extremes. An example would be the specification of heavy equipment with enclosed cabs that have heating and/or air conditioning.

3.4 Radiological Hazards

None of the site history or background about SWMU 25 indicates that ionizing radiation is a threat to site personnel. If the contractor plans to utilize nuclear sourced equipment (i.e., soil compaction nuclear density gauge) then the radiological hazards associated with this equipment shall be addressed in the contractor's SSHP.

3.5 Biological Hazards

Snakes and insects are found throughout the area at TEAD. Possible cover and habitat for these shall be minimized in the field operations area (i.e., weed control, organized storage). Hantavirus exposure is also a potential hazard while performing tasks at SWMU 25. Potential risk factors for hantavirus exposure include disturbing mice nests or areas with visible mouse droppings. The contactor's SSHP shall address personnel awareness of the potential biological risks, and provide guidance for controlling the hazards or safely decontaminating.

3.6 UXO Hazards

Hazards from UXO are the potential for fragmentation, thermal burns, and concussions that would result from an unintentional detonation. If Ordnance and Explosives (OE) is discovered during field activities, operations shall be stopped, the area evacuated, and notification made to the CO. The government is responsible for evaluation and disposal of the OE.

3.7 Action Levels for Mitigating Site Hazards

The contractor's SSHP shall address their specific means of controlling and mitigating the safety, chemical, physical, and biological hazards identified above. Specifically action levels for the following shall be addressed:

a. Implementation of engineering controls, air-conditioned cabs on heavy equipment, dust suppression, and limiting the number of people allowed in the work zone.
b. Upgrading and downgrading levels of personal protective equipment based on personal air monitoring or dust monitoring. Based on the evaluation provided in Section 8.0, it appears that Level D PPE will suffice for this remedial action.
c. Stopping work or evacuating the site based on air monitoring or a physical catastrophe such as fire.
d. Preventing exposure to the public and non-workers at the site through access control.
e. Distance restrictions for operation of equipment near overhead power lines shall be established based on OSHA requirements in 29 CFR 1910.333 and 29 CFR 1926.416.
f. Implement levels for heat and cold stress monitoring.

3.8 Hazard Communication Program

Because of the various hazards and potential hazards described in the preceding paragraphs, the contractor shall include a hazard communication program in the SSHP for this project. Details regarding this program are found in 29 CFR 1926.59.

4.0 STAFF ORGANIZATION, QUALIFICATIONS, AND RESPONSIBILITIES

Implementation of the Contractor SSHP should be accomplished through an integrated effort of the following Contractor personnel: project manger, project engineer, safety and health manager (certified industrial hygienist [CIH]), site safety and health officer (SSHO), and trained workforce. Additionally, the services of a board eligible occupational health physician and certified health physicist should be identified, as needed. The contractor's SSHP shall indicate the lines of authority and responsibilities for each identified persons. It shall also include the mechanism employed for coordinating and controlling the work activities of subcontractors and suppliers. At least two people at the site must be trained in first aid and cardiopulmonary resuscitation (CPR).

5.0 TRAINING

The Contractor should include in the SSHP an employee training program complying with, but not necessarily limited to those requirements specified and approved of by the Corps of Engineers in EM 385-1-1, ER 385-1- 92, and in OSHA 29 CFR 1926.65, 29 CFR 19926.59, and 29 CFR 1926.62 that includes training on hazardous waste operations, lead, activity hazard analysis, PPE use, heavy equipment operation, confined space entry, hazard communication, and annual follow-up training. While 29 CFR 1926.65 provide for varying levels of training based on job function, the USACE policy is to require the following:

a. A minimum of 40-hours of hazardous, toxic and radioactive waste health and safety training off site.
b. Three days or 24 hours of actual field experience under the direction of a trained supervisor.
c. 8 hours of refresher training, annually.
d. On site supervisors shall have an additional 8 hours of training covering the employers safety and health program, personal protective equipment program, spill containment and health and hazard monitoring.
e. Pre-entry briefing covering the contractor's SSHP. This will include training on chemical, biological, radiological, and physical hazards.
f. At least two persons currently certified in First Aid/Cardiopulmonary Resuscitation American Red Cross or equivalent agency, shall be present on site at all times during site operations.
g. Hazard Communication (29 CFR 1926.59).
h. Lead awareness (29 CFR 1926.62).
i. TEAD-Specific Requirements: The contractor shall include Tooele Army Depot training in Hazardous Waste Management. Prior to field work, TEAD will provide four hours of

training in managing and handling hazardous waste at TEAD. The Contractor shall schedule training for applicable personnel through TEAD point-of-contact, Dean Reynolds (435) 833-3504. The Contractor is required to have at least one employee on site that has completed the Hazardous Waste Management Program.

6.0 PERSONAL PROTECTIVE EQUIPMENT

6.1 General

The contractor shall provide all contractor personnel with appropriate personal safety equipment and protective clothing, and should ensure that all safety equipment and protective clothing is kept clean and well maintained. The Contractor should also maintain an inventory of Level C personal protective equipment, enough for two governmental personnel and up to two site visitors per day. Based on the assessment provided in Section 8.0 below, it is anticipated that Level C PPE is the initial level of protection during excavation and other mechanical soil handling tasks during the corrective measures work at SWMU 25. Other proposed activities can be accomplished in Level D. However, the Contractor must verify this assessment and allow for upgrading/downgrading PPE based on actual site condition.

6.2 Level D PPE

6.2.1 Conditions for Level D

Level D protection shall be used under the following conditions:

a. The atmosphere contains no known hazard above individual or combined PELs, essentially nuisance contamination only.
b. Concentrations of airborne toxic compounds do not exceed normal background concentrations or specified action levels requiring use of respiratory protective equipment.
c. The atmosphere contains at least 19.5 percent oxygen.
d. Work functions preclude splashes, immersion in, unexpected inhalation of, or direct contact with hazardous concentrations of harmful chemicals.

6.2.2 Level D Ensemble

Level D protective equipment shall consist of the following, unless otherwise stated in the contractor's SSHP:

a. Dedicated work clothing consisting of long pants and sleeved shirts. These may include chemical resistant overalls, standard Tyvek® coveralls, or standard cotton work uniforms.
b. Safety shoes or boots meeting the specifications of American National Standards Institute (ANSI) Z41.
c. Gloves; these may include heavy work gloves (e.g., cotton or leather), impervious gloves (Viton). In general, it is recommended that an impervious glove be worn during all site activities that could result in direct contact with potentially contaminated soil, water or other items.

d. Safety glasses, goggles, face shield or other approved eye protection. All approved eye protection must meet the specifications of ANSI Z87.1. The use of contact lenses is discouraged during Level D operations, but not prohibited. Rather, safety glasses or goggles which fit over prescription lenses or prescription glasses or goggles are recommended.
e. Hard hat, unless specifically stated otherwise. All approved hard hats must meet the specifications of ANZI Z89.1.
f. Escape breathing apparatus, when potential site conditions warrant.
g. Hearing protection (muff or plugs) as necessary, depending on measured decibel readings in the field. The protective device must have a noise reduction rating capable of providing the wearer with enough protection so as to reduce the received noise level to below 85 db.
h. Reflective traffic vests.

Because of recent concerns of hantavirus, which has resulted in several deaths in the Southwestern part of the United States, respirators may be worn by site personnel in Level D ensembles. For this reason, air purifying respirators (APR), half-faced or full-faced, with either a dust filter or high efficiency particulate air (HEPA) filter (P100) will be made available. The dust filter will suffice, as the hantavirus is typically transported via dust particles.

6.3 Level C PPE

6.3.1 Conditions for Level C

Although not anticipated, Level C protection shall be used under the following conditions:

a. Concentration of known airborne organic compounds or dust in the breathing zone is above the action levels given in the contractor's SSHP for individual work tasks.
b. The types of air contaminants have been identified, concentrations measured, and an APR, and chemically protective clothing are available that can protect against the identified contaminants.
c. The substance(s) has adequate warning properties, and the criteria for the use of an APR have been met.
d. The atmospheric contaminants, liquid splashes, or other direct contact will not adversely affect any exposed skin.
e. The atmosphere contains at least 19.5 percent oxygen.

6.3.2 Level C Ensemble

If Level C is required, the Contractor must provide a respiratory protection program that includes a written program, medical evaluations, personal monitoring or assessment, training, fit testing and maintenance. Level C protective equipment shall consist of the following:

a. Chemical-resistant coveralls. This may include polyethylene coated Tyvek®, or Saranex®.
b. Safety shoes with disposable boots covers or, Chemical-resistant safety boots, meeting the specifications of ANSI Z41.

c. Chemical resistant gloves. This includes: disposable inner and outer gloves, such as viton, butyl rubber, or polyvinyl alcohol.
d. Work gloves as necessary to prevent cuts, scrapes, and pinches.
e. Half-faced or full-faced APR with combination organic vapor HEPA (P100) cartridges for individual work tasks.
f. Safety glasses, goggles or face shield when wearing a half-face APR, meeting the specifications of ANSI Z87.1.
g. Hard hat, unless specifically stated otherwise, meeting the specifications of ANSI Z89.1.
h. Cuffs sealed to boots or gloves with duct tape, or equivalent.
i. Hearing protection as necessary depending on measured decibel readings in the field. The protective device must have a noise reduction rating capable of providing the wearer with enough protection as to reduce the received noise level below 85 db.
j. Reflective traffic vest.

6.4 Other

Levels B and A PPE are not anticipated to be necessary for this corrective measures field project. The contractor's SSHP, however, must address the contractor's assessment level of PPE needed to complete the work safely.

7.0 MEDICAL SURVEILLANCE

7.1 Medical Surveillance Program

7.1.1 Written Program

The Contractor shall write and include in the SSHP a medical surveillance program (29 CFR 1926.65 and 29 CFR 1926.62) that includes scheduling of examinations, certification of fitness, compliance with OSHA requirements for hazardous waste operations, lead, respiratory protective equipment use, and information provided to the physician.

7.1.2 Occupational Physician

The Contractor shall employ the services of a board certified or board eligible occupational health physician to determine the minimum content and frequency of examinations for their personnel. The determination shall be based on probable site conditions and tasks, exposure to the COCs and the use of protective equipment. The occupational health physician shall certify employee fitness for duty. A copy of each employee's certification shall be included as an appendix to the contractor's SSHP.

7.2 Emergency Medical Assistance

Prior to work start-up, the contractor should establish an emergency medical assistance network. The Fire Department, ambulance service, and clinic or hospital emergency room should be identified and phone numbers for these services posted in a conspicuous place at the project site.

A map and directions indicating the fastest route to the hospital emergency room should also be posted. The hospital information is given below.

Mountain West Medical Center
2000 North Main Street
Tooele, Utah
Phone: 435-833-3933

From SWMU 25 proceed to State Highway 36
Turn left and proceed northward about six miles through the city of Tooele
Hospital is on Main Street (Highway 36) on the west (left) side of the street.

A vehicle shall be available on-site during all work activities to transport injured personnel to the identified emergency medical facilities. A cellular telephone shall be available on site during all work activities to summon emergency help. The contractor shall make a suitable first-aid kit available at the site for use by trained personnel. The first aid kit shall contain enough supplies to service the number of people on site and shall be approved by the occupational health physician. A supply of fresh water or potable emergency eyewash with a minimum 5-gallon capacity and 15-minute duration shall also be available at the work site. The contractor shall notify the medical facility to be used in emergencies of the approximate duration of work at the site, and provide a list of contaminants expected to be encountered prior to beginning work.

8.0 EXPOSURE MONITORING/AIR SAMPLING PROGRAM

8.1 Air Sampling Screening Program

The contractor shall include in the SSHP an air sampling and screening program (personal and area) for invasive soil operations. The program shall establish reporting requirements and notification procedures. Air monitoring shall be performed to assess the degree of Exposure to Lead during the invasive soil operations. A mixture occupational exposure level could be reached at 7.7 mg/M^3 of total dust (Safety Now, Controlling Chemical Exposures at Hazardous Waste Sites with Real-Time Measurements (Marlow, 1999)). A monitoring program would serve to evaluate the adequacy of the level of personal protective equipment being used. Personal monitoring is required by 29 CFR 1926.62, if an employee develops symptoms indicating possible exposure to hazardous substances, if the examining physician determines that more frequent surveillance is necessary, or if increased sampling frequency is required by the contractor’s industrial hygienist.

Table 4 – Dust Exposure Calculation Work Sheet

DUST EXPOSURE CALCULATION WORKSHEET				
Dust Level			Safety Factor for this site =	4
Chemical	Exposure Limit (mg/m3)	Maximum Soil Concentration (mg/kg)	Exposure Limit Based on Single Compound (EL Mix, mg/m3)	Dust Quotient for Each Compound (level/limit)
Lead	0.05	33,251	.38	6.65E+05
Thallium	0.1	1,510	16.56	1.51E+04
			Sum	6.80E+05
		Dust Exposure Level at Mixture PEL =	0.368	

8.1.1 Calculating Equivalent Dust Concentration

Equation used in this calculation

Dust Action Level (for mixed dusts)

$$= \frac{(10^6 \text{ mg/Kg}) \text{ (Sum of [(concentration mg/Kg)]/(Exposure Limits)]}}{\text{(Safety factor)}}$$

Dust Action Level = is the air concentration of total dust (mixed) at which the sum of the COCs would be at the established exposure limit (PEL).

4 = safety factor used to account for the degree of confidence in concentration information (number between 1 and 10).

When the atmosphere contains less than 7.7 mg/M^3 of total dust, it contains no more than the PEL for the mixed COCs.

8.2 Total Nuisance Dust

The total nuisance dust TLV may apply before the exposure limit for the mixture PEL. The contractor shall keep the total nuisance dust (particulates not otherwise specified) below ½ the ACGIH TLV of 10 mg/M^3.

8.3 Visible Dust

It is generally recognized that total dust is visible at the 2 to 3 mg/M3 concentrations. The contractor shall use direct reading air monitoring instruments (real-time aerosol monitor) to establish dust levels.

8.4 Personal Air Sampling

The contractor shall collect personal air samples for lead; the sampling program shall be supervised by the contractor's CIH. The samples shall be analyzed by a laboratory participating in the American Industrial Hygiene Association Proficiency Analytical Testing program and shall have as fast a turn-a-round time as possible.

8.5 Dust Control

Dust controls including, but not limited to, engineering and administrative controls such as wetting the soil during excavation and soil handling to prevent wind blown dust, and selection of equipment and techniques to reduce dust creation will be critical to controlling exposures to the COCs and total nuisance dust. These controls shall be implemented to control dust generation to a level not visible, or if employees complain of wind-blown grit.

8.6 Noise Monitoring

The contractor's SSHP shall provide for the evaluation of noise from all field operations that may expose workers to noise levels at or above 85 dBA. The noise monitoring shall be sufficient enough to determine if workers need to participate in a hearing conservation program and use hearing protection. Note that hearing protection is required for all exposures greater than 85 dBA.

9.0 HEAT/COLD STRESS MONITORING

9.1 General

The stress of working in a hot environment can cause a variety of illnesses including heat exhaustion or heat stroke; the latter can be fatal. Use of personal protective equipment can significantly increase heat stress. To reduce or prevent heat stress, the contractor shall, as required when ambient temperatures exceed 70 degrees Fahrenheit, implement scheduled rest periods and require beverage consumption to replace body fluids and salts. The following procedures and action levels may be used, depending upon ambient site conditions, by the contractor to monitor potential heat stress:

a. Heart Rate. Count the radial pulse during a 30-second period as early as possible in the rest period. If the heart rate exceeds 110 beats per minute at the beginning of the rest period, shorten the next work cycle by one-third and keep the rest period the same. If the heart rate exceeds 110 beats per minute at the next rest period, shorten the following work cycle by another one-third and also monitor oral temperature.
b. Oral Temperature. Use a clinical thermometer (three minutes under the tongue) to measure the oral temperature at the end of the work period (before drinking). If the oral temperature exceeds 99.6 degrees Fahrenheit, shorten the next work cycle by one-third without changing the rest period. If the oral temperature exceeds 99.6 degrees Fahrenheit at the beginning of the next rest period, shorten the following work cycle by another one-third. Field team members shall not be allowed to wear Level C PPE when oral temperatures exceed 100.6 degrees Fahrenheit.

9.1.1 Symptoms of Heat Stress

Personal shall be trained to recognize the symptoms of heat stress and the appropriate action to take upon recognition. Even though physiological monitoring is not always necessary, it is essential that personnel understand the significance of heat stress and it recognition. The Contractor should refer to the section on heat stress in the NIOSH/OSHA/USCG/EPA document, *Occupational Safety and Health Guidance Manual for Hazardous Waste Sites Activities*, published by the U.S. Department of Health and Human Services in October 1985.

9.2 Cold Stress Monitoring

During the winter months, cold stress may be an occupational stress, which needs consideration during the corrective measures work. Frostbite and hypothermia are the primary concerns. The SSHP shall contain information about the signs and symptoms of frostbite and describe work practices that will reduce the risk of injury. To reduce or prevent cold stress, the contractor shall, as required when ambient temperatures are below 40 degrees Fahrenheit, implement work practices that will reduce the risk of injury due to frostbite or hypothermia. The contractor shall use current guidance by the ACGIH in Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices in developing work practice controls.

10.0 STANDARD OPERATING SAFETY PROCEDURES, ENGINEERING CONTROLS, AND WORK PRACTICES

The contractor's SSHP shall address the implementation of feasible engineering and work practice controls to reduce and maintain employee exposure at or below the OSHA PEL for the COCs. Specifically, the contractor's SSHP must indicate methods of achieving the following:

a. The buddy system
b. Prohibitions such as eating, drinking or smoking in the work zones
c. Required permits, such as for excavations, and hot work.
d. Material handling procedures
e. Confined space entry – indicate negative declaration if no confined space entries will be required
f. Electrical Safety
g. Lockout/Tagout
h. Equipment guarding
i. Excavation and trench safety
j. Fall protection
k. Hazard Communication for chemicals brought to the site
l. Illumination
m. Work site sanitation

11.0 SITE CONTROL MEASURES

Site control requires the establishment of a regulated area, designated work zones, and evacuation protocol, and site security. The contractor SSHP shall discuss the establishment of site work zones: exclusion, contamination reduction, and support. The contractor's SSHP shall provide a map delineating the zone or modify as site conditions warrant.

11.1 Work Zones

11.1.1 Exclusion Zone

The exclusion zone (EZ), or "hot" zone is the zone where contamination or potential contamination exists. Since this zone has the potential for workers to be exposed to contaminants, all field staff entering this zone will wear the appropriate PPE, adhere to the training and medical surveillance requirements presented in this document. Areas with higher concentrations of contaminants within this zone will be identified with field stakes with colored flags. Field personnel entering the exclusion zone or the higher concentration part of the exclusion zone will enter and exit through a controlled center. Gross decontamination will take place near the "hotline," before proceeding to the Contamination Reduction Zone. Prior to fieldwork occurring in this zone, the SSHO shall develop an emergency exit area. The exclusion zone will be demarcated by using lines, placards, hazard tape and/or signs, or enclosed by physical barriers, such as chains, fences or ropes.

11.1.2 Contamination Reduction Zone

The contamination reduction zone (CRZ) is the zone where field staff and equipment will undergo gross decontamination. This zone is located between the exclusion and support zones. The CRZ will serve as a buffer to further reduce the probability of the clean zone becoming contaminated or being affected by other existing hazards. It will provide additional assurance that the physical transfer of contaminants via personnel or equipment is limited through a combination of decontamination procedures and a minimum required distance between exclusion and support zones. Two lines of decontamination stations should be set up within the contamination reduction corridor (the designated area within the CRZ where decontamination takes place), one for personnel and one for equipment.

Initially, the CRZ will be considered to be a non-contaminated area. At the boundary between the exclusion and the CRZ, decontamination stations will be established, one for personnel and one for heavy equipment. Exit from the exclusion zone will be through a designated decontamination corridor. Personnel assisting with decontamination will wear a level of PPE at or one level below that used by personnel in the EZ.

As operations proceed, the area around the decontamination station may become contaminated, but to a much lesser degree than the exclusion zone. On a relative basis, the amount of contaminants will decrease from the hotline to the support zone due to the distance involved and the decontamination procedures used. The "contamination control line" separating the CRZ and the support zone will be designated with yellow or orange surveyor tape, or other suitable material.

11.1.3 Support Zone

The support zone, the outermost part of the regulated area, is free from recognized site hazards. Support equipment such as the command post and safety vehicles, will be located in this area. Since normal work attire is appropriate within this zone, potentially contaminated personal protective clothing, equipment and samples will not be permitted. The location of the command post and other support facilities in the support zone at each site will depend on a number of factors, including:

a. Accessibility: topography, open space available, locations of roads, or other limitations.
b. Visibility: line of sight to all activities in the exclusion zone is preferable.
c. Wind direction: the support facilities preferably should be located upwind of the exclusion zone. Shifts in wind direction and other conditions may be such that an ideal location based on wind direction alone does not exist.
d. Resources: water, electricity, places of refuge.

Access to the CRZ from the support zone will be through a controlled access point. Personnel entering the CRZ to assist in decontamination will wear the prescribed PPE. Re-entrance into the support zone will require removal of any PPE worn in the CRZ.

12.0 SITE SECURITY

12.1 Authorized Personnel

For remedial action activities at SWMU 25, only authorized personnel will be allowed to enter the restricted work area associated with the field activities. Prior to field work, TEAD security will be notified of the upcoming activity. Depot security will provide visitor or contractor badges as needed for entrance onto the depot. Badges are available for pre-authorized contractor and subcontractor personnel through the TEAD Security Office in Building S-100, (435) 833-2314. Access to the work area will be controlled by the SSHO, who will establish the bounds of the regulated area. The following measures will be taken to assure site security:

a. All workers entering the regulated areas will be subject to the provisions of the contractor's SSHP. The site safety officer will have the responsibility and authority to enforce this requirement.
b. All workers entering the restricted work zone will have the appropriate training, PPE and respiratory protection and will be enrolled in an established medical surveillance program.
c. A site Visitor's Logbook, located in the support zone, will be maintained.

12.2 Site Control

Site control will vary from strict property perimeter controls to no controls at all. When possible client personnel will be requested to investigate any suspicious activities at the field site. In some cases an independent security watch may be needed. Security at the site will be the responsibility of the client during non-activity times (including weekends) unless stated otherwise. To maintain security at the site during working hours, the contractor will:

a. Control all site entrances/exits through the support zone through installation of appropriate safety barricades, signs, and/or signal lights.
b. Establish a personnel identification system, including limitations to an individual's approved activities.
c. Be responsible for enforcing entry/exit requirements.
d. Utilize temporary fencing, where feasible.
e. Post warning signs should the utilization of temporary fencing not be feasible.

12.3 Non-Working Hours Security

To maintain security during non-working hours, the Contractor will secure the site prior to leaving at the end of a working day. All equipment and supplies will be secured or stored in locked facilities, and open holes and trenches will be covered with plywood or surrounded by a fence, or similar safety provision.

12.4 Communication Systems

Two types of communications systems shall be available for all workers assigned to field projects. The contractor SSHP shall specify which types of communication systems will be available. One system will ensure adequate communication between site personnel, and the other will ensure the ability to contact personnel and particularly emergency assistance off the site.

12.4.1 Internal Communication

Internal Communication is used to:

a. Alert team members to emergencies.
b. Pass along safety information, such as weather conditions that could affect heat stress, cold stress or general safety, etc.
c. Maintain site control.
d. Facilitate site work by being able to call to the appropriate party for information, without having to decontaminate the work party and equipment and secure the site.

12.4.2 Verbal communication

Verbal communication can be impeded by onsite background noise and the use of personal protective equipment. Thus, it is vital that pre-arranged signals of communication be arranged prior to the initiation of site activities, particularly when heave equipment work is involved. Common types of internal communication devices include:

a. Radios.
b. Noisemakers: bell, compressed air horn, megaphone, siren, whistle.
c. Visual signals.

12.4.3 External Communication

Primary means of external communication devices are telephones, radios, facsimile machines, and computer networks. External communication systems between onsite and offsite personnel are necessary to:

a. Coordinate emergency response efforts.
b. Report to upper management about site activities.
c. Maintain contact with essential offsite personnel.

13.0 PERSONAL AND EQUIPMENT DECONTAMINATION

Equipment that may require decontamination includes tools, equipment, vehicles (heavy equipment) and certain protective equipment. All material and equipment used for decontamination must be disposed of properly. Disposable clothing, tools buckets, brushes, and all other equipment that is contaminated will be secured in appropriate specification drums or other containers and labeled. Clothing that will be reused, not completely decontaminated on-site, will be secured in plastic bags before being removed from the site.

13.1 Decontamination Procedures

Decontamination procedures are implemented as a means of control of potential migration of chemicals or other site contaminants to clean areas, and to prevent personnel exposure to chemicals or pathogens, which may contaminate clothing or protective gear. This may entail a “step-off” decontamination or a more detailed decontamination procedure. Personnel entering restricted work zones during activities must decontaminate upon exiting from the restricted work zone. All personnel, including visitors, must enter and exit the restricted work zone through the primary entrance/exit. In addition, before demobilization, contaminated equipment will be decontaminated before it is moved from the restricted work zone. Any material that is generated during decontamination procedures will be labeled and stored until final disposal arrangements are made.

> Note: The type of decontamination solution to be used is dependent on the type of chemical or pathogenic hazard. The Contractor’s SSHP will specify decontamination materials when they are different than ordinary soap and water. All personnel will be require to wash their hands (and face optional) with soap before eating, drinking or smoking (unless specific procedures are in place to ensure that a drink can be taken without the possibility of contamination), and before leaving the contamination reduction zone. Decontamination solutions will be changed daily (at a minimum) and collected and stored on-site until disposal arrangements are finalized.

13.1.1 Portable Equipment Decontamination

Equipment used in the restricted work zone in areas where contact with site contaminants is likely to occur shalll be protected from contamination as much as possible by measures such as enclosure in plastic bags, or by preventing contact with contaminated materials. Equipment decontamination will be determined by the nature of the equipment and extent of contamination.

13.1.2 Gross Decontamination

Equipment moved from the restricted work zone before the end of the job shall undergo a gross decontamination step near the work site prior to proceeding to the support zone.

13.1.3 Heavy Equipment and Vehicle Decontamination

Heavy equipment and vehicle decontamination should involve scraping and rough brushing (broom-clean condition) to remove dirt and other visible contamination from the frame and tires.

13.1.4 Personal Decontamination

All personnel will go through decontamination before leaving the exclusion zone for the support zone or other clean area. Personnel will also go through decontamination if their protective clothing becomes torn. Personnel may return to the exclusion zone after changing into clean protective gear. The majority of work anticipated will be conducted in Level D or Level C personal protective equipment. The typical Level D or Level C decontamination approach associated with a “step-off” decontamination procedure. The decontamination approach presented is applicable to personnel conducting environmental sampling or who come in physical contact with potentially contaminated media.

13.1.5 Emergency Decontamination

It is not anticipated that emergency decontamination of personnel or heavy equipment will be necessary. Emergency decontamination of site personnel may be necessary for medical reasons or in the event of major contamination by contact with contaminated material.

14.0 EMERGENCY RESPONSE PLAN AND EQUIPMENT.

14.1 Emergency Response Plan

As part of the SSHP, the Contractor should develop an emergency response and contingency plan for on-site emergencies. The Contractor should provide for emergency response equipment and first aid arrangements. At a minimum the Contractor shall address the following:

a. Pre-emergency planning.
b. Personnel roles, lines of authority, training, and communication.
c. Emergency recognition and prevention.
d. Safe distances and places of refuge.
e. Site security and control.

f. Evacuation routes and procedures.
g. Decontamination.
h. Emergency medical treatment and first aid.
i. Emergency alerting and response procedures.
j. Critique of response and follow-up.
k. Personal protective equipment and emergency equipment.

14.2 Emergency Response Contacts

Entry into Tooele Army Depot can be accessed through the main gate. All badge requirements and security issues are handled in Building S-100. All emergency response issues such as fire, security or emergency medical services are handled by dialing 911.

14.3 Emergency Telephone Numbers

All emergency plans shall include elements to protect the local affected population in the event of an accident or emergency. These are the names of personnel responsible of responding in the event of an emergency (e.g., in case OE is found); first aid and medical attention; and air monitoring. All emergency response issues such as fire, security, or emergency medical services are handled by dialing 911.

Table 3 – Emergency Numbers

TEAD Fire Department and Paramedics	(435) 833-2015 or 911
TEAD Security	(435) 833-2314
TEAD Environmental Management Office	(435) 833-3504
Mountain West Medical Center	(435) 843-3600
Tooele City Fire Department	(435) 882-0701 or 911
Tooele City Police Department	911
62nd Ordnance Co (EOD)	(435) 833-2962

14.4 Spill and Discharge Control

Spill and Discharge Control: The Contractor shall be responsible for developing, implementing, maintaining, and supervising a comprehensive Spill and Discharge Control Plan. The plan should be submitted to the Contracting Officer (CO) for approval and should be a component of the Site Safety and Health Plan (SSHP). This plan should provide contingency measures for potential spills and discharge from potentially hazardous on-site materials or trucks transporting hazardous materials offsite.

15.0 ACCIDENT PREVENTION.

15.1 General

Any additional accident prevention plan topics not otherwise covered in this HSDA that are required by ER 385-1-92 shall be addressed in the Contractor SSHP. For example, EM 385-1-1 requires that an activity hazard analysis (AHA) is developed for each set of tasks. The AHA describes each step of each tasks, identifies the potential chemical, biological and safety hazards associated with each step and the controls to be implemented. Additionally, it lists equipment to be used, training and inspection requirements. The Contractor shall include in the SSHP an AHA for each set of tasks to be performed (e.g., excavation, , collection of confirmation soil samples, etc.).

15.1.1 Daily Safety Inspections

The Contractor is responsible to conduct daily safety inspections to ensure that the SSHP is being followed and is effective.

15.1.2 Accident Report

In the event of an accident, the Contracting Officer shall be notified according to the following, using ENG Form 3394, March 99.

a. Class A Accident: an accident in which the resulting total cost of property damage and personal injuries is $1,000,000 or greater; or an injury or occupational illness resulting in a fatality or permanent total disability.
b. Class B Accident: an accident in which the resulting total cost of property damage and personal injuries is $200,000 or more but less than $1,00,000; or an injury or occupational illness resulting in permanent partial disability; or when three or more personnel are hospitalized as inpatients as the result of a single occurrence.
c. Class C Accident: an accident in which the resulting total cost of property damage and personal injuries in $20,000 or more but less than $200,000; a nonfatal injury that causes any loss of time from work beyond the day or shift on which it occurred; or a nonfatal occupational illness that causes loss of time from work or disability at any time.
d. Class D Accident: an accident in which the resulting total cost of property damage is 2,000 or more but less than $20,000.

16.0 LOGS, REPORTS, AND RECORDKEEPING

The contractor should maintain logs and records that relate to all aspects of the contractor SSHP implementation. These records shall be submitted to the Contracting Officer. They should include:

a. Training log of 40-hour initial and 3-day supervised field training.
b. Supervisory certifications.
c. 8-hour annual refresher training.
d. Medical surveillance program fitness for duty.
e. First aid and CPR certification.
f. Site Specific indoctrination.
g. Tailgate meetings.
h. Visitor register.
i. Daily inspections (may be part of the quality control report).
j. OSHA 200 or 300 log, whichever is in effect.

k. Safety and health program documents, such as the SSHP.
l. Equipment maintenance.
m. Exposure assessment monitoring

State of Utah

Department of Environmental Quality

Dianne R. Nielson, Ph.D.
Executive Director

DIVISION OF SOLID & HAZARDOUS WASTE
Dennis R. Downs
Director

OLENE S. WALKER
Governor

GAYLE F. McKEACHNIE
Lieutenant Governor

cf: File - Restoration
Larry McFarland

TAT
12/1

November 24, 2003

Tom Turner
Chief, Industrial Risk Management
Tooele Army Depot
Tooele, Utah 84074-5000

Re: Final Remedial Action Plans, SWMU 11 and SWMU 25, Tooele Army Depot, Tooele, Utah (EPA #UT3213820894)

Dear Mr. Turner:

We have completed our review of the subject work plans. All of our previous comments have now been addressed satisfactorily. As already communicated to you at the last RAB/TRC meeting on October 8, 2003, remedial work at both SWMUs 11 and 25 can now begin.

Thank you for your continuing and professional cooperation. If you have any questions, please contact Helge Gabert of my staff at 538-6001.

Sincerely,

Dennis R. Downs

Dennis R. Downs, Executive Secretary
Utah Solid and Hazardous Waste Control Board

DRD\HG\ts

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c: Myron Bateman, M.P.H., R.S., Health Officer/Director, Tooele Co. Health Dept.
Eric Johnson, USEPA Region VIII
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Carl Cole, U.S. Army Corps of Engineers, TEAD

File to TEAD 2003

TN200302363